User's Manual

SMARTDAC+

Model GX10/GX20/GP10/GP20

Paperless Recorder First Step Guide

vigilantplant.

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PRS 108-02E

Introduction

Thank you for purchasing the SMARTDAC+ GX/GP Series Paperless Recorder (hereafter referred to as the GX/GP). This manual explains the basic operation, installation, and wiring of the GX/GP.
This manual supports the following products.

Model	Product Name
GX10/GX20	Paperless Recorder (panel mount type)
GP10/GP20	Paperless recorder (portable type)
GX60	I/O Base Unit (Expandable I/O)

Although the display of GX20 is used in this guide, GX10/GP10/GP20 can be operated similarly.
This manual denotes devices with their product names or model (e.g. GX60).
To ensure correct use, please read this manual and the following manuals thoroughly before beginning operation.
For a detailed description of the product, see the electronic manual.
For specifications, refer to General Specifications.

Paper Manuals

Manual Title	Manual No.
Models GX10/GX20/GP10/GP20 Paperless Recorder First Step Guide	IM 04L51B01-02EN (This manual)
Quick, Easy Steps	IM 04L51B01-04Z1
Precaution on the use of SMARTDAC+ (Only delivered with each module or GX60)	IM 04L51B01-91EN

Electronic Manuals

You can download these manuals from the following web page:
www.smartdacplus.com/manual/en/

Manual Title	Manual No.
Models GX10/GX20/GP10/GP20 Paperless Recorder First Step Guide	IM 04L51B01-02EN
Models GX10/GX20/GP10/GP20 Paperless Recorder User's Manual	IM 04L51B01-01EN
Models GX10/GX20/GP10/GP20 Communication Command User's Manual	IM 04L51B01-17EN
SMARTDAC+ STANDARD Universal Viewer User's Manual	IM 04L61B01-01EN
SMARTDAC+ STANDARD Hardware Configurator User's Manual	IM 04L61B01-02EN
Advanced security function (/AS) User's Manual	IM 04L51B01-05EN
EtherNet/IP communication (/E1) User's Manual	IM 04L51B01-18EN
WT communication (/E2) User's Manual	IM 04L51B01-19EN
LOG scale (/LG) User's Manual	IM 04L51B01-06EN
DXA170 DAQStudio User's Manual	IM 04L41B01-62EN
Precaution on the use of SMARTDAC+	IM 04L51B01-91EN

Genaral Specifications

Title	General specifications No.
GX10/GX20/GP10/GP20 Paperless Recorder (panel mount type)	GS 04L51B01-01EN
GX10/GX20/GP10/GP20 Paperless Recorder (portable type)	GS 04L52B01-01EN
GX60 I/O Base Unit (Expandable I/O) / GX90EX Expansion Module	GS 04L53B00-01EN
GX90XA/GX90XD/GX90YD/GX90WD I/O modules	GS 04L53B01-01EN

* The last two characters of the manual number and general specification number indicate the language in which the manual is written.

Notes

- The contents of this manual are subject to change without prior notice as a result of continuing improvements to the instrument's performance and functions.
- Every effort has been made in the preparation of this manual to ensure the accuracy of its contents. However, should you have any questions or find any errors, please contact your nearest Yokogawa dealer.
- Copying or reproducing all or any part of the contents of this manual without the permission of Yokogawa is strictly prohibited.

Authorised Representative in the EEA

The Authorised Representative for this product in the EEA is:
Yokogawa Europe B.V.
Euroweg 2, 3825 HD Amersfoort,The Netherlands

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Safety Precautions

- This instrument conforms to IEC safety class I (provided with terminal for protective grounding), Installation Category II, and EN61326-1 (EMC standard), Measurement Category II (CAT II).*
  * Measurement Category II (CAT II) is for the analog input modules.
  Measurement category II (CAT II) applies to measuring circuits connected to low voltage installation, and electrical instruments supplied with power from fixed equipment such as electric switchboards.
- This instrument is an EN61326-1 (EMC standard) class A instrument (for use in commercial, industrial, or business environments). The influence rate (judgment condition A) in the immunity test environment is within ± 10 % of the range.
- The general safety precautions described here must be observed during all phases of operation. If the SMARTDAC+ is used in a manner not described in this manual, the SMARTDAC+ safety features may be impaired. Yokogawa Electric Corporation assumes no liability for the customer's failure to comply with these requirements.
- The SMARTDAC+ is designed for indoor use.

■ About This Manual

- Please pass this manual to the end user. We also ask you to store this manual in a safe place.
- This guide is intended for the following personnel:
  Engineers responsible for installation, wiring, and maintenance of the equipment.
  Personnel responsible for normal daily operation of the equipment.
- Read this manual thoroughly and have a clear understanding of the product before operation.
- This manual explains the functions of the product. It does not guarantee that the product will suit a particular purpose of the user.

■ Precautions Related to the Protection, Safety, and Alteration of the Product

The following safety symbols are used on the product and in this manual.

"Handle with care." To avoid injury and damage to the instrument, the operator must refer to the explanation in the manual.

Protective ground terminal

Functional ground terminal
(do not use this terminal as a protective ground terminal.)

Alternating current

Direct current

ON (power)

OFF (power)

- For the protection and safe use of the product and the system in which this product is incorporated, be sure to follow the instructions and precautions on safety that are stated in this manual whenever you handle the product.
  Take special note that if you handle the product in a manner that violates these instructions, the protection functionality of the product may be damaged or impaired. In such cases, Yokogawa does not guarantee the quality, performance, function, and safety of product.
- When installing protection and/or safety circuits such as lightning protection devices and equipment for the product and control system or designing or installing separate protection and/or safety circuits for fool-proof design and fail-safe design of the processes and lines that use the product and the control system, the user should implement these using additional devices and equipment.
- If you are replacing parts or consumable items of the product, make sure to use parts specified by Yokogawa.
- This product is not designed or manufactured to be used in critical applications that directly affect or threaten human lives. Such applications include nuclear power equipment, devices using radioactivity, railway facilities, aviation equipment, air navigation facilities, aviation facilities, and medical equipment. If so used, it is the user's responsibility to include in the system additional equipment and devices that ensure personnel safety.
- Do not modify this product.

- **Use the Correct Power Supply**
  Ensure that the source voltage matches the voltage of the power supply before turning ON the power. In the case of portable type and the GX60 (power inlet type), ensure that it is within the maximum rated voltage range of the provided power cord before connecting the power cord.
- **Use the Correct Power Cord and Plug (Portable Type, GX60 (power inlet type))**
  To prevent electric shock or fire, be sure to use the power cord supplied by Yokogawa. The main power plug must be plugged into an outlet with a protective earth terminal. Do not disable this protection by using an extension cord without protective earth grounding.
  The power cord is designed for use with this instrument. Do not use the power cord with other instruments.
- **Connect the Protective Grounding Terminal**
  Make sure to connect the protective grounding to prevent electric shock before turning ON the power.
  The power cord that comes with the portable type and the GX60 (power inlet type) are three prong type power cord. Connect the power cord to a properly grounded three-prong outlet.
- **Do Not Impair the Protective Grounding**
  Never cut off the internal or external protective grounding wire or disconnect the wiring of the protective grounding terminal. Doing so invalidates the protective functions of the instrument and poses a potential shock hazard.
- **Do Not Operate with Defective Protective Grounding**
  Do not operate the instrument if the protective grounding might be defective. Also, make sure to check them before operation.
- **Do Not Operate in an Explosive Atmosphere**
  Do not operate the instrument in the presence of flammable gas, vapors, or combustible dust. Operation in such an environment constitutes a safety hazard. Prolonged use in a highly dense corrosive gas (H_2S, SOx, etc.) will cause a malfunction.
- **Do Not Remove Covers**
  The cover should be removed by Yokogawa's qualified personnel only. Opening the cover is dangerous, because some areas inside the instrument have high voltages.

- **Ground the Instrument before Making External Connections**
  Connect the protective grounding before connecting to the item under measurement or control unit.
- **Damage to the Protection**
  Operating the instrument in a manner not described in this manual may damage the instrument's protection.
- **Wiring**
  To prevent shock, attach the included terminal cover after wiring. Make sure to use appropriate wires and crimp-on lugs.

CAUTION

This instrument is a Class A product. Operation of this instrument in a residential area may cause radio interference, in which case the user is required to take appropriate measures to correct the interference.

■ Exemption from Responsibility

- Yokogawa makes no warranties regarding the product except those stated in the WARRANTY that is provided separately.
- Yokogawa assumes no liability to any party for any loss or damage, direct or indirect, caused by the user or any unpredictable defect of the product.

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GX10, GX20, GP10, GP20, GX20W Paperless Recorder

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SMARTDAC+ STANDARD Universal Viewer

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TCP/IP Software

GX10, GX20, GP10, GP20,GX20W Paperless Recorder

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GX10, GX20, GP10, GP20,GX20W Paperless Recorder

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Handling Precautions of the GX/GP

- Use care when cleaning this instrument, especially its plastic parts. Use a soft dry cloth. Do not use organic solvents, such as benzene or thinner, or other cleansers. They may cause discoloring and deformation.
- Keep electrically charged objects away from the signal terminals. Failure to do so may damage the GX/GP.
- Do not apply volatile chemicals to the display, panel keys, etc. Do not allow rubber and vinyl products to remain in contact with the GX/GP for long periods of time. Doing so may damage the GX/GP.
- When not in use, make sure to turn off the power switch.
- If there are any symptoms of trouble such as strange odors or smoke coming from the GX/GP, immediately turn off the power switch and the power supply source. Then, contact your nearest Yokogawa dealer.

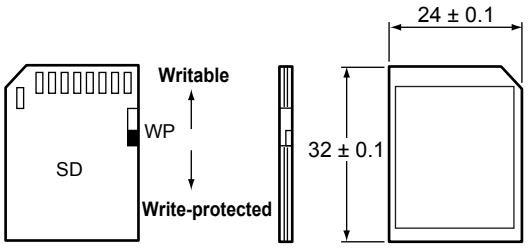
SD Memory Card Handling Precautions

- SD memory cards are delicate and should be handled with caution.
- Yokogawa provides no warranty for damage to, or loss of data recorded on the SD memory card, regardless of the cause of such damage or loss. Please always make backup copies of your data.
- Do not store or use the SD memory card in places with static electricity, near electrically charged objects, or where electrical noise is present. Doing so can result in electric shock or damage.
- Do not disassemble or modify the SD memory card. Doing so can result in damage.
- Do not physically shock, bend, or pinch the SD memory card. Doing so can lead to malfunction.
- During reading/writing of data, do not turn OFF the power, apply vibration or shock, or pull out the card. Data can become corrupt or permanently lost.
- Only use Yokogawa SD memory cards. Operation cannot be guaranteed with other brands of card.
- When inserting the SD memory card into the instrument, make sure you orient the card correctly (face up or down) and that you insert it securely. If not inserted correctly, the card will not be recognized by the instrument.
- Never touch the SD memory card with wet hands. Doing so can lead to electric shock or malfunction.
- Never use the SD memory card if it is dusty or dirty. Doing so can lead to electric shock or malfunction.
- The SD memory card comes formatted.
  SD cards must be formatted according to the standard established by the SD Association (https://www.sdcard.org/home). If you want format the SD memory card, use the instrument’s Format function. If using a PC to perform the formatting, use the SD card formatter software available from the above SD Association.
- You can use SD/SDHC cards (up to 32 GB) on the GX/GP.

SD Memory Card Specifications and Characteristics

Electrical specifications	Operating voltage: 2.7 V to 3.6 V (memory operation)
Operating temperature / humidity conditions	–25 to 85°C / 20 to 85% RH, no condensation
Storage temperature / humidity conditions	–40 to 85°C / 5 to 95% RH, no condensation

Unit: mm



Checking the Package Contents

After receiving the product and opening the package, check the items described below. If the wrong items have been delivered, if items are missing, or if there is a problem with the appearance of the items, contact your nearest Yokogawa dealer.

Check that the product that you received is what you ordered by referring to the model name and suffix code given on the name plate on the GX/GP.

NO. (Instrument Number)
When contacting the dealer from which you purchased the instrument, please give them the instrument number.

MODEL and SUFFIX Codes

GX10/GX20[13]

Model	Suffix Code		Optional Code	Description
GX10				Paperless recorder (Panel mount type, Small display)
GX20				Paperless recorder (Panel mount type, Large display)
Type	-1			Standard (max. no. of measurement ch : 100)
	-2			Large Memory (max. no. of measurement ch : 500) [11][12]
Language		E		English, degF, DST (summer/winter time)[10]
Options			/AS	Advanced security function
			/BC	Black cover
			/C2	RS-232[1]
			/C3	RS-422/485[1]
			/CG	Custom display function
			/D5	VGA output[2]
			/E1	EtherNet/IP communication
			/E2	WT communication[14]
			/FL	Fail output, 1 point
			/LG	LOG scale
			/MT	Mathematical function (with report function)
			/MC	Communication channel function
			/P1	24 VDC/AC power supply[4]
			/UH	USB Interface (host 2 ports)
			/UC[ ]0	Analog (universal) input module preinstalled (clamp terminal)[3]
			/US[ ]0	Analog (universal) input module preinstalled (M3 screw terminal)[3]
			/CR[ ][ ]	Digital output module, digital input module preinstalled[5]

GP10/GP20[13]

Model	Suffix Code				Optional Code	Description
GP10						Paperless recorder (Portable type, Small display)
GP20						Paperless recorder (Portable type, Large display)
Type	-1					Standard (max. no. of measurement ch : 100)
	-2					Large Memory (max. no. of measurement ch : 500) [12]
Language		E				English, degF, DST (summer/winter time)[10]
Power supply			1			100 VAC, 240 VAC [16]
			2			12V DC [17]
Power cord				D		Power cord UL/CSA standard
				F		Power cord VDE standard
				R		Power cord AS standard
				Q		Power cord BS standard
				H		Power cord GB standard
				N		Power cord NBR standard
				W		Screw terminal, power cord not included
Options					/AS	Advanced security function
					/C2	RS-232[1]
					/C3	RS-422/485[1]
					/CG	Custom display function
					/D5	VGA output[2]
					/E1	EtherNet/IP communication
					/E2	WT communication[14]
					/FL	Fail output, 1 point
					/LG	LOG scale
					/MT	Mathematical function (with report function) [15]
					/MC	Communication channel function
					/UH	USB interface (host 2 ports)
					/UC[ ]0	Analog (universal) input module preinstalled (clamp terminal)[3]
					/US[ ]0	Analog (universal) input module preinstalled (M3 screw terminal)[3]
					/CR[ ][ ]	Digital output module, digital input module preinstalled[5]

Models in Which I/O Modules Are Preinstalled

Model	Suffix Code	Optional Code	Description
GX10	-□E/[ ][ ]		Paperless recorder (panel mount type)
GX20			
GP10	-□E1[ ]/[ ][ ]		Paperless recorder (portable type)
GP20			
Options (analog Input)[3] [11]		/UC10	With analog input module, 10ch (Clamp terminal)
		/UC20	With analog input module, 20ch (Clamp terminal)[7]
		/UC30	With analog input module, 30ch (Clamp terminal)[8]
		/UC40	With analog input module, 40ch (Clamp terminal)[5]
		/UC50	With analog input module, 50ch (Clamp terminal)[5]
		/US10	With 10ch analog input module (M3 screw terminal)
		/US20	With 20ch analog input module (M3 screw terminal)[7]
		/US30	With 30ch analog input module (M3 screw terminal)[8]
		/US40	With 40ch analog input module (M3 screw terminal)[5]
		/US50	With 50ch analog input module (M3 screw terminal)[5]
Options (digital I/O)[4]		/CR01	With digital I/O module (output: 0, input: 16)[8, 9, 15]
		/CR10	With digital I/O module (output: 6, input: 0)[8]
		/CR11	With digital I/O module (output: 6, input: 16)[7, 8, 9, 15]
		/CR20	With digital I/O module (output: 12, input: 0)[6]
		/CR21	With digital I/O module (output: 12, input: 16)[6, 9, 15]
		/CR40	With digital I/O module (output: 24, input: 0)[6]
		/CR41	With digital I/O module (output: 24, input: 16)[6, 9, 15]

1 /C2 and /C3 cannot be specified together.
2 /D5 can be specified only for the GX20/GP20.
3 Only one option can be specified.
4 Only one option can be specified.
5 /UC40, /UC50, /US40, and /US50 cannot be specified for the GX10/GP10.
6 /CR20, /CR21, /CR40, and /CR41 cannot be specified for the GX10/GP10.
7 If /UC20 or /US20 is specified for the GX10/GP10, /CR11 cannot be specified.
8 If /UC30 or /US30 is specified for the GX10/GP10, /CR01, /CR10, and /CR11 cannot be specified.
9 A digital input module has M3 screw terminals.
10 The Display language is selectable from English, German, French, Russian, Korean, Chinese, Japanese.
To confirm the current available languages, please visit the following website.
URL: www.yokogawa.com/ns/language/
11 Solid state relay type (Type Suffix Code: -U2).
12 Can be specified only for the GX20/GP20.
13 To connect an I/O base unit, you will need one I/O expansion module for the GX/GP.
14 /MC option must be separately specified when the WT communication is selected.
15 Optional code /MT (MATH) required if using the GX90XD's or GX90WD's pulse input.
16 Selectable only when the power cord suffix code is D or F or R or Q or H or N.
17 Selectable only for the GP10 when the power cord suffix code is W.

I/O Base Unit (Expandable I/O) [1]

Model	Suffix Code					Description
GX60						I/O base unit
Type	-EX					I/O Expansion
Area		N				General
Power supply			1			100 VAC, 240 VAC
Power cord				D		Power cord UL/CSA standard
				F		Power cord VDE standard
				R		Power cord AS standard
				Q		Power cord BS standard
				H		Power cord GB standard
				N		Power cord NBR standard
				W		Screw terminal, power cord not included [2]

1 Include GX90EX (Expansion module)
2 Intended use for panel or rack mounting only.

I/O Expansion Module (Expansion Module)

Model	Suffix Code				Description
GX90EX					I/O Expansion Module
Port	-02				2 ports
Type		-TP1			Twisted pair cable
-			N		Always N
Area				-N	General

I/O Modules

GX90XA

Model	Suffix Code					Description
GX90XA						Analog Input Module
Channels	-10					10 channels
Type		-C1				Current, Scanner type (isolated between channels)
		-L1				DCV/TC/DI (400 VAC, 1 min), Scanner type (isolated between channels)
		-U2				Universal, Solid state relay scanner type (3-wire RTD b-terminal common)
		-T1				DCV/TC/DI, Electromagnetic relay scanner type (Isolated between channels)
-			N			Always N
Terminal type				-3		Screw terminal (M3)
				-C		Clamp terminal
Area					N	General

GX90XD

Model	Suffix Code					Description
GX90XD						Digital Input Module [1]
Channels	-16					16 channels
Type		-11				Open collector/Non-voltage, contact (shared common), Rated 5 VDC
-			N			Always N
Terminal type				-3		Screw terminal (M3)
				-C		Clamp terminal
Area					N	General

1 Optional code /MT (MATH) required if using the pulse input.

GX90YD

Model	Suffix Code					Description
GX90YD						Digital Output Module
Channels	-06					6 channels
Type		-11				Relay, SPDT(NO-C-NC)
-			N			Always N
Terminal type				-3		Screw terminal (M3)
Area					N	General

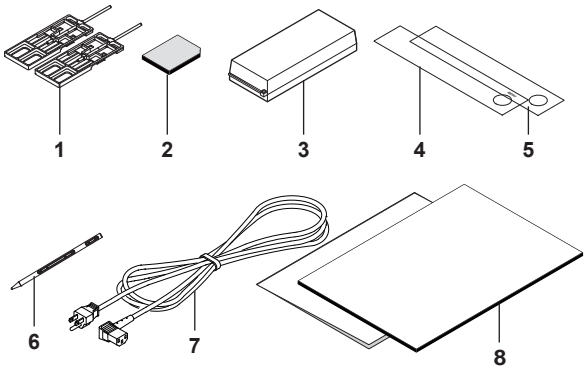
GX90WD

Model	Suffix Code					Description
GX90WD						Digital Input/Output Module [1]
Channels	-0806					Input 8 channels, Output 6 channels
Type		-01				Open collector/non-voltage contact (shared common), rated 5 VDC; Relay, SPDT (NO-C-NC)
-			N			Always N
Terminal type				-3		Screw terminal (M3)
Area					N	General

1 Optional code /MT (MATH) required if using the pulse input.

Standard Accessories

The instrument is shipped with the following accessories. Make sure that all accessories are present and undamaged.



No.	Name	Part Number/Model	Qty.	Notes
1	Mounting bracket	B8740DY	2	GX10/GX20 only
2	SD memory card	773001	1	1GB
3	Dummy cover	B8740CZ		For empty slots
4	Tag plate	B8740FE	1	GX20
		B8740ME	1	GP20
		B8741FE	1	GX10
		B8741ME		GP10
5	Sheet	B8740FF	1	GX20
		B8740MF	1	GP20
		B8741FF	1	GX10
		B8741MF	1	GP10
6	Stylus	B8740BZ	1	
7	Power cord	A1074WD	1	D: Power cord UL, CSA st'd [1]
		A1009WD	1	F: Power cord VDE st'd [1]
		A1024WD	1	R: Power cord AS st'd [1]
		A1054WD	1	Q: Power cord BS st'd [1]
		A1064WD	1	H: Power cord GB st'd [1]
		A1088WD	1	N: Power cord NBR st'd [1]
8	Manual	IM 04L51B01-02EN	1	First Step Guide
		IM 04L51B01-04Z1	1	Quick, Easy Steps

1 Except GP10 power supply suffix code: 2

Optional Accessories (Sold separately)

Name	Part Number/ Model	Minimum. Q'ty	Notes
Mounting bracket	B8740DY	2	GX10/GX20 only
SD memory card	773001	1	1GB
Stylus	B8740BZ	1	
Shunt resistor (for M3 screw terminal)	X010-250-3	1	250 Ω ± 0.1%
	X010-100-3	1	100 Ω ± 0.1%
	X010-010-3	1	10 Ω ± 0.1%
Shunt resistor (for clamp terminal)	438920	1	250 Ω ± 0.1%
	438921	1	100 Ω ± 0.1%
	438922	1	10 Ω ± 0.1%
Dummy cover	B8740CZ	1	For module slot

GX/GP Style Number, Release Number, and Firmware Version Number

Style number: The GX/GP hardware ID number. This number is written on the name plate (H column).

Release number: The GX/GP firmware ID number. This number is written on the name plate (S column). This number matches with the integer part of the firmware version number.

Example: If the firmware version number is 1.01, the release number is 1.

Firmware version number: This number appears on the system information screen of the GX/GP. To view the number, see section 2.3, "Displaying Various Types of Information" in the User's Manual, IM 04L51B01-01EN.

Conventions Used in This Manual

- This manual covers information regarding GX/GPs whose display language is English.
- For details on the language setting, see the Paperless Recorder User's Manual, IM04L51B01-01EN.

Unit

K: Denotes 1024. Example: 768K (file size)

k: Denotes 1000.

The notes and cautions in this manual are indicated using the following symbols.

Improper handling or use can lead to injury to the user or damage to the instrument. This symbol appears on the instrument to indicate that the user must refer to the user's manual for special instructions. The same symbol appears in the corresponding place in the user's manual to identify those instructions. In the manual, the symbol is used in conjunction with the word "WARNING" or "CAUTION."

WARNING

Calls attention to actions or conditions that could cause serious or fatal injury to the user, and precautions that can be taken to prevent such occurrences.

CAUTION

Calls attentions to actions or conditions that could cause light injury to the user or damage to the instrument or user's data, and precautions that can be taken to prevent such occurrences.

Note

Calls attention to information that is important for proper operation of the instrument.

Protection of Environment

Control of Pollution Caused by the Product

This is an explanation for the product based on “Control of pollution caused by Electronic Information Products” in the People’s Republic of China.

产品中有毒有害物质或元素的名称及含量

部件名称		有毒有害物质或元素					
		铅(Pb)	汞(Hg)	镉(Cd)	六价铬(Cr6+)	多溴联苯(PBB)	多溴二苯醚(PBDB)
印刷电路		N/A	N/A	N/A	N/A	✓	✓
内部接线材料		N/A	N/A	N/A	N/A	✓	✓
外壳/ 机箱	塑料	N/A	N/A	N/A	N/A	✓	✓
	金属	N/A	N/A	N/A	N/A	✓	✓
I/O 模块外壳	塑料	N/A	N/A	N/A	N/A	✓	✓
电源		N/A	N/A	N/A	N/A	✓	✓
正面边框		N/A	N/A	N/A	N/A	✓	✓
	显示器 (LCD)	N/A	N/A	N/A	N/A	✓	✓
标准附件/ 可选附件	安装支架	N/A	N/A	N/A	N/A	✓	✓
	电源线(GP10/GP20/GX60 (power inret type))	N/A	N/A	N/A	N/A	✓	✓
	SD 存储卡	N/A	N/A	N/A	N/A	✓	✓
	分流电阻	N/A	N/A	N/A	N/A	✓	✓

✓：表示该部件的所有均质材料中的有毒有害物质或元素的含量均低于GB/T 26572 标准所规定的限量要求。

N/A：表示该部件中至少有一种均质材料中的有毒有害物质或元素的含量超过GB/T 26572 标准所规定的限量要求。

该标志为环境保护使用期限，根据SJ/T11364，适用于在中国(台湾、香港、澳门除外)销售的电子电气产品。只要遵守该产品的安全及使用注意事项，从产品生产之日起至该标志所示年限内，不会因为产品中的有害物质外泄或突变而导致环境污染或对人身财产产生重大影响。

Waste Electrical and Electronic Equipment (WEEE), Directive

This is an explanation of how to dispose of this product based on Waste Electrical and Electronic Equipment (WEEE), Directive. This directive is only valid in the EU.

- Marking
  This product complies with the WEEE Directive marking requirement. This marking indicates that you must not discard this electrical/electronic product in domestic household waste.
- Product Category
  With reference to the equipment types in the WEEE directive, this product is classified as a “Monitoring and Control instrumentation” product.
  Do not dispose in domestic household waste.
  When disposing products in the EU, contact your local Yokogawa Europe B.V. office.

How to Dispose the Batteries

This is an explanation about the new EU Battery Directive (DIRECTIVE 2006/66/EC). This directive is only valid in the EU.

Batteries are included in this product. Batteries incorporated into this product cannot be removed by yourself. Dispose them together with this product. When you dispose this product in the EU, contact your local Yokogawa Europe B.V.office. Do not dispose them as domestic household waste.

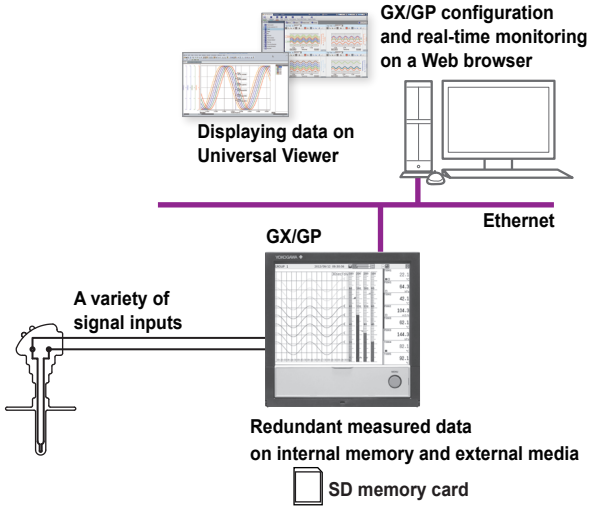
Battery type: Lithium battery

Notice: The symbol (see above) means they shall be sorted out and collected as ordained in ANNEX II in DIRECTIVE 2006/66/EC.

Functional Overview

Overview

The GX/GP is a paperless recorder that can display measured data in real time on its touch screen and save the data in an SD memory card.


GX/GP configuration and real-time monitoring on a Web browser
Displaying data on Universal Viewer
Ethernet
GX/GP
A variety of signal inputs
Redundant measured data on internal memory and external media
SD memory card

A Variety of Source Signals

The GX/GP can connect to DC voltage, TC, RTD, ON/OFF, and DC current (mA) inputs and measure temperature, flow rate, and other parameters. The GX/GP acquires data by sampling input signals at the set scan interval. The shortest scan interval is 100 ms. Up to four alarm conditions can be specified on each measurement channel.

Expandable Module Construction

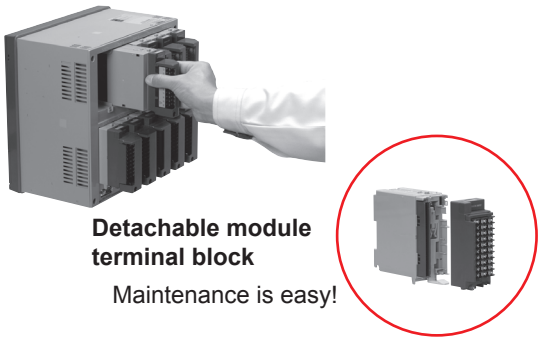
The I/O section is modular, so you can configure your system according to the input types and number of measurement points.

Modules

Model	Name	Channels
GX90XA	Analog input module	10
GX90XD	Digital input module	16
GX90YD	Digital output module	6
GX90WD	Digital Input/Output Module	Input : 8 , Output : 6

- Up to 10 modules can be installed in the GX20/GP20.
- Up to 3 modules can be installed in the GX10/GP10.
- Different modules can coexist.

* Up to nine modules for the GX20/GP20 and two modules for the GX10/GP10 when an GX60 is connected.

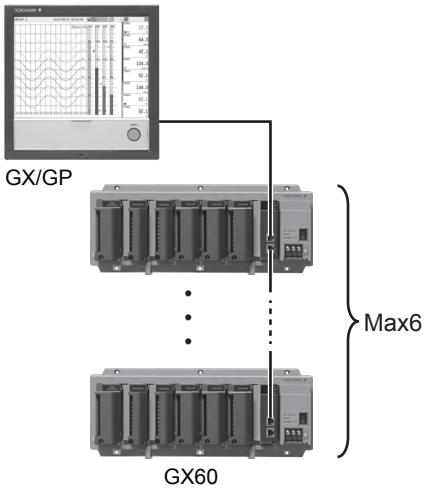


Detachable module terminal block

Maintenance is easy!

GX60 Connection and Multichannel Measurement

An GX60 I/O can be connected to the GX20/GP20 to measure up to 450 channels. On the standard type, you can connect the GX60 to allocate input sections at different locations.



GX/GP configuration

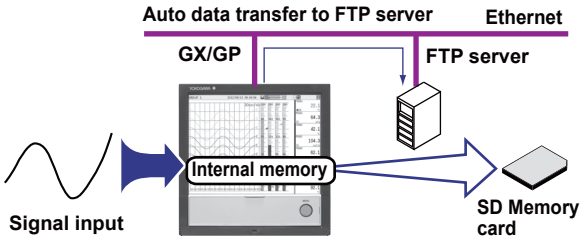
Item	GX/GP	
	Standard Type	Large Memory Type
Maximum number of connectable GX60	6	6
Maximum number of I/O modules (main unit + GX60)	10 [1]	45 [2]
Maximum number of I/O channels	100	500

1 2 on the rear of the GX10/GP10, 9 on the rear of the GX20/GP20.

2 9 on the rear of the GX20/GP20.

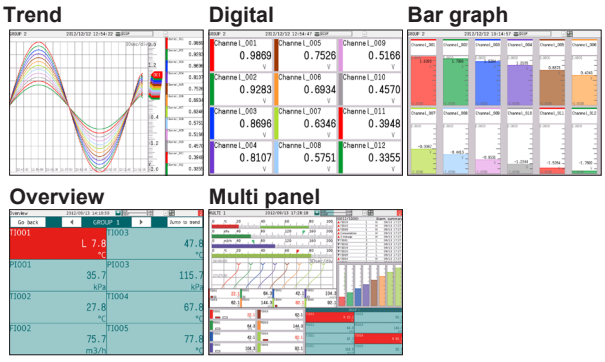
Data Storage

There are two ways to store data. One way is to record measured data at all times (display data and event data). The other way is to record only when events, such as alarms, occur (event data). Measured data is saved to the internal memory at the specified interval. Data in the internal memory can be saved to the SD memory card automatically or manually. Measured data can be transferred automatically to an FTP server over an Ethernet connection.



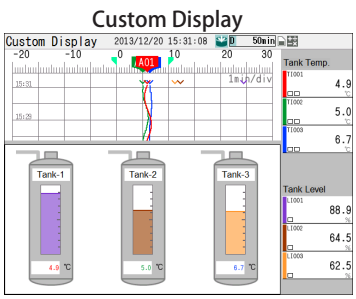
A Variety of Display Functions

Measured data can be displayed in groups as trend waveforms, values, and bar graphs. There is also an overview display that you can monitor all channels on a single screen.



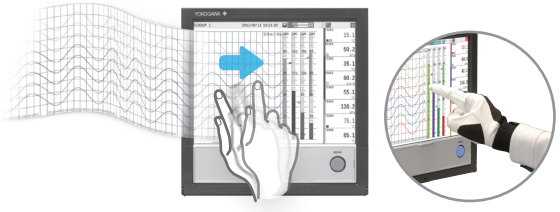
Custom Display (Option, /CG)

You can control and monitor on a custom display consisting of digital, trend, bar graph, and other components and images can that are laid out freely. Custom displays are created using DAQStudio (DXA170), a software application sold separately for creating custom display screens.
Custom displays that you create are saved to the GX/GP internal memory from DAQStudio through Ethernet communication or an external storage medium.

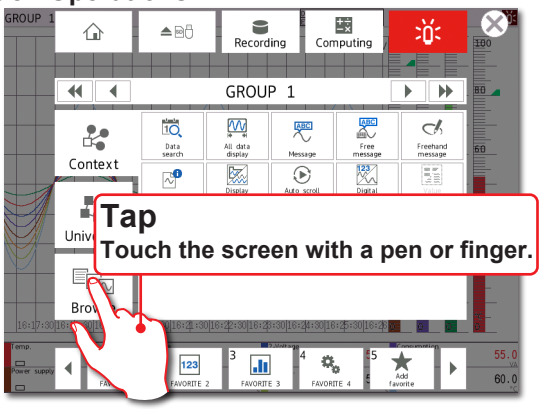


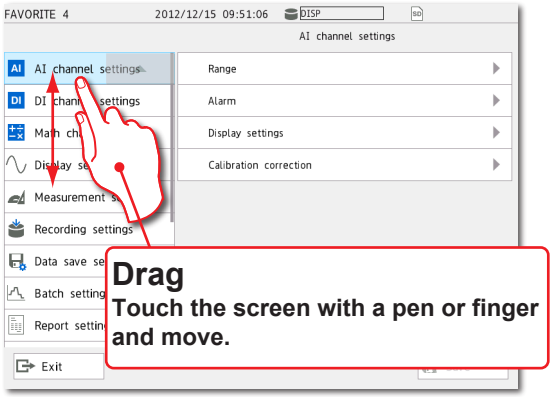
Touch Screen

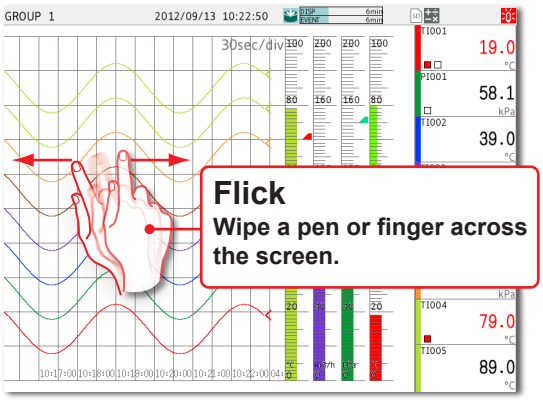
The GX/GP touch screen enables intuitive operation. You can tap the icons of setup and operation items as well as scroll and zoom in on and out of waveforms by directly touching the screen. In addition, when you are working on-site, you can operate the GX/GP with your gloves on.

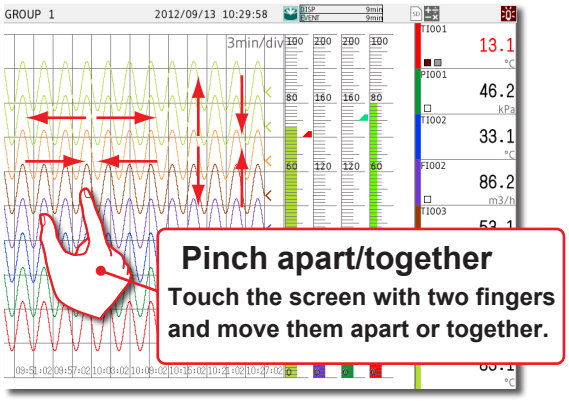


Touch Operations



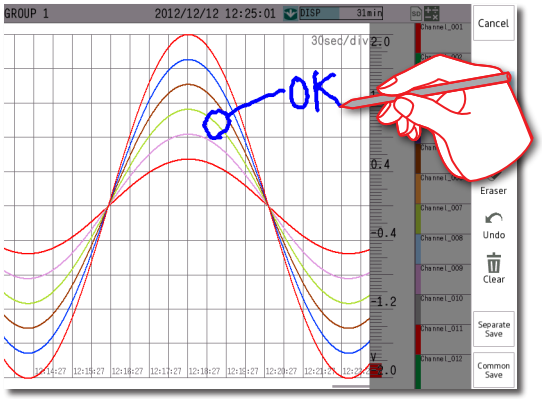






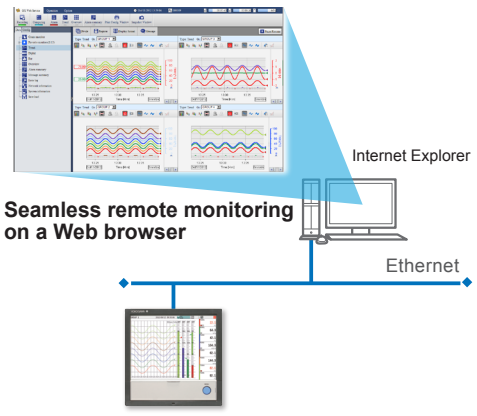
Freehand Messages

You can use the touch pen or your finger to write text and draw marks freely in the waveform area. The messages that you write can easily be displayed from information displays such as the message summary and memory summary.



Versatile Network Functions and Software

The Ethernet interface enables you to monitor the GX/GP from a Web browser. E-mails can be sent through this interface when alarms and other events occur.
In addition, you can use the Modbus protocol to read data from other devices on the network and display it.
As for the software, Universal Viewer can be used to view measured data and convert the data into other data formats.

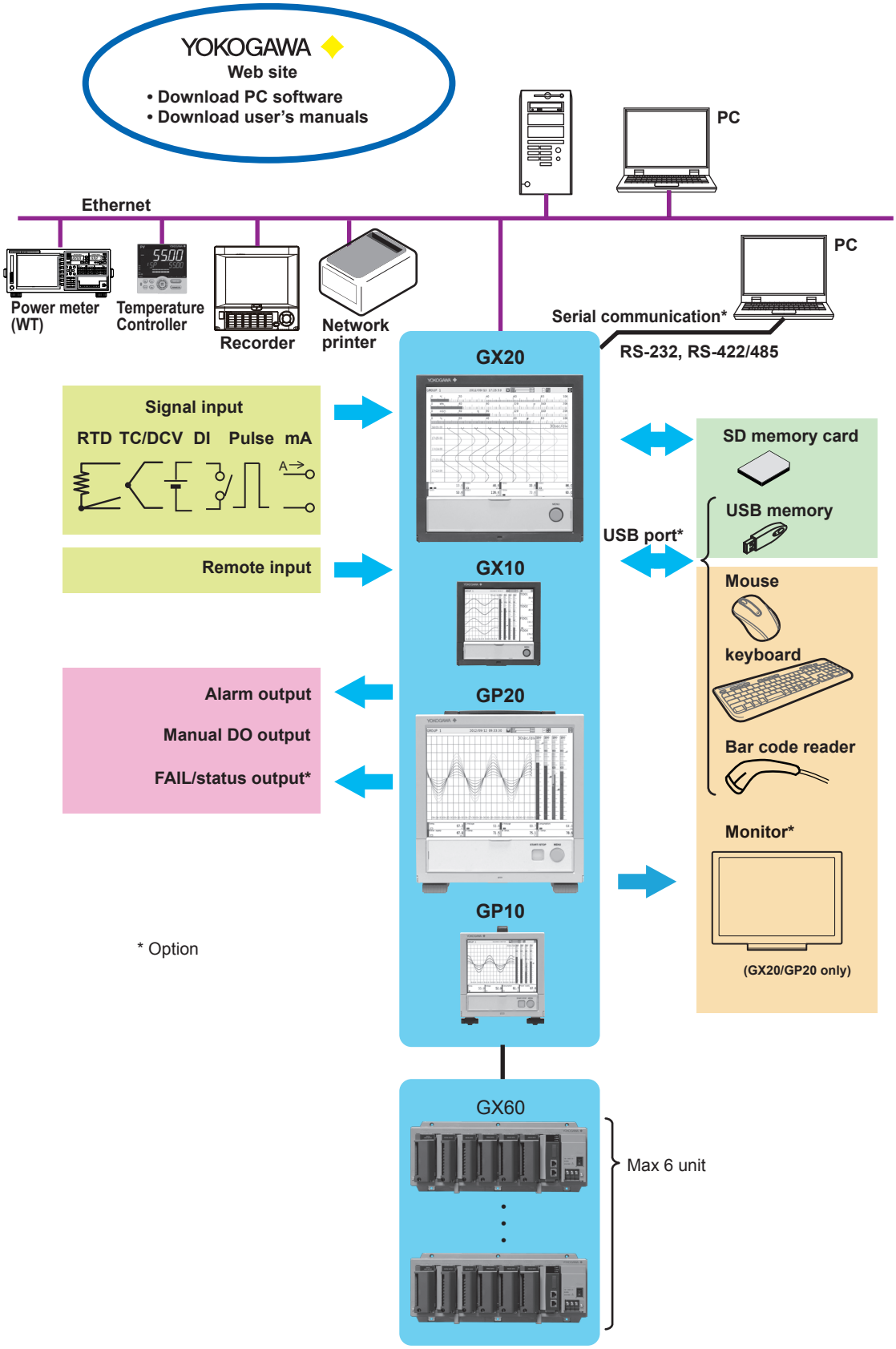


Other Functions

Math function (/MT option)	Expressions can be assigned to math channels to perform various computations.
FAIL output (/FL option)	This function transmits alarms when the GX/GP fails.
Security function	You can allow only registered users to use the GX/GP. In addition, certain operations can be prohibited.
Remote control	This function executes specified operations by combining input modules and the event action function.
Advanced security function (/AS option)	A security function that complies with US FDA 21CFR Part11. Electronic signatures can be added to measured data.
EtherNet/IP communication (/E1 option)	This function is equipped with a server function that enables communication with EtherNet/IP devices.
WT communication (/E2 option)	This function acquires measured and calculated data from a power meter and displays and records it along with the measured values of the GX/GP.
LOG scale (/LG option)	This function measures logarithmic voltage that has been converted from a physical value, scales the voltage, and displays the resultant data.

System Configuration

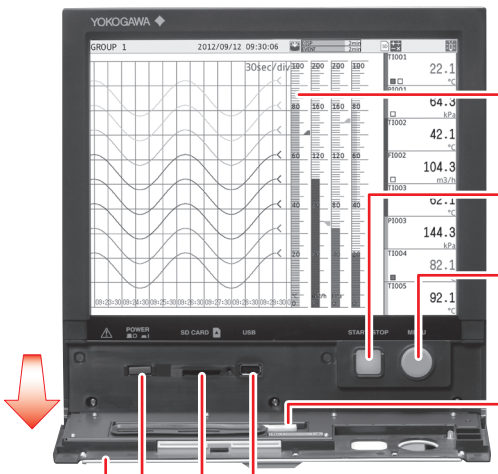
You can configure a GX/GP system as shown below.



Component Names

GX20/GX10

GX20 front panel



LCD
Shows the trend display and other displays and the setup screen

START/STOP key
Starts and stops recording

MENU key
Press this once to show a menu for accessing various screens.

Stylus pen (touch pen)

USB port (/UH option)
USB2.0 compliant. Connect a USB memory device, mouse, keyboard, etc.

SD memory card slot
SD memory card (up to 32 GB)
Format: FAT32 or FAT16
A 1 GB card is included.

Power switch

Front door

MENU key
Alarms are indicated with a red LED.

Front door lock mechanism
A front door is locked/unlocked by a slide at the bottom.

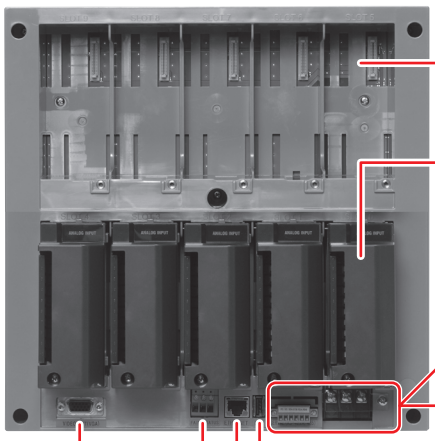
Lock

Use an off-the-shelf door lock key.

GX10 front panel

GX10 rear panel

GX20 rear panel



I/O module slot
GX10, GP10: 3 slots (0 to 2)
GX20, GP20: 10 slots (0 to 9)

I/O module
Connect I/O signals.

Power inlet (GP10/GP20)

Serial port (/C2 option)
RS-232 terminal

Power supply terminal and protective ground terminal (GX10/GX20)

Serial port (/C3 option)
RS-422/485 terminal

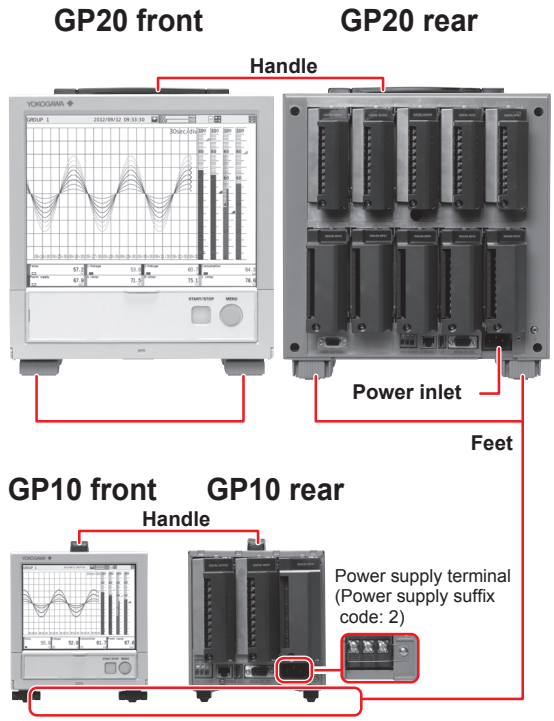
USB port (/UH option)
USB 2.0 compliant. Connect a USB memory device, mouse, keyboard, etc.

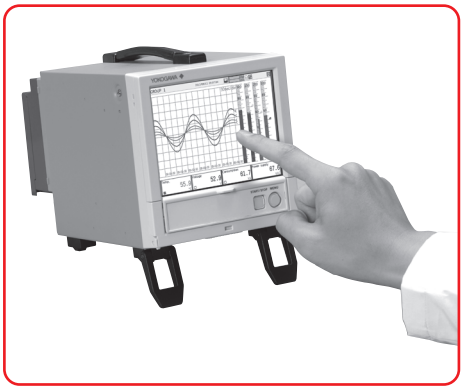
Ethernet port
10BASE-T/100BASE-TX port

FAIL output terminal (/FL option)

VGA output connector (/D5 option)
Connects to an external monitor

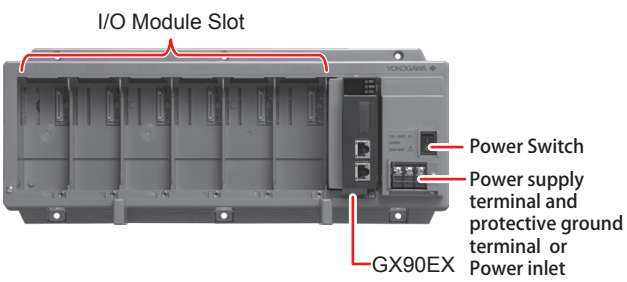
GP20/GP10



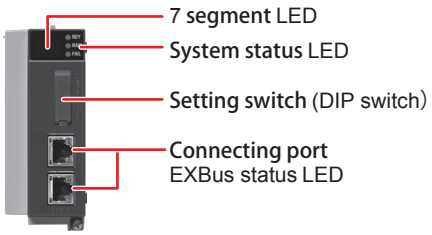


GX60/GX90EX

GX60 I/O Base Unit (Expandable I/O)

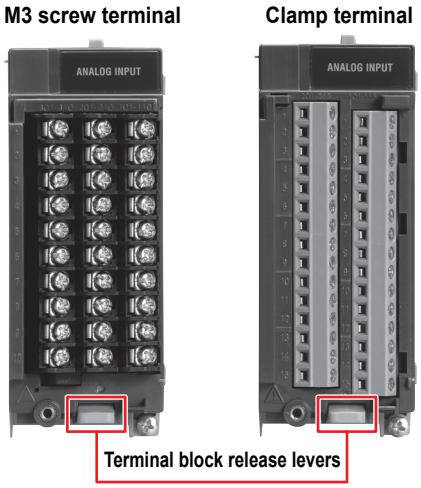


GX90EX Expansion Module

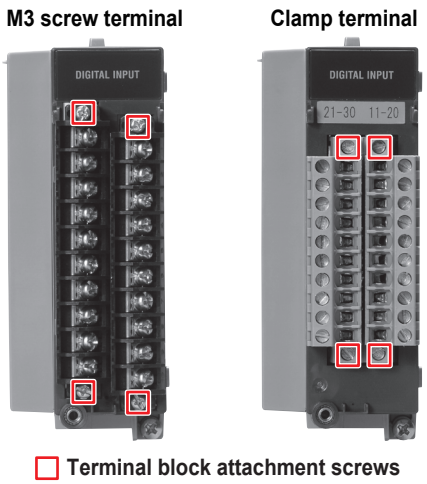


GX90XA/GX90XD/GX90YD/GX90WD

GX90XA Analog Input Module



GX90XD Digital Input Module



GX90YD Digital Output Module

M3 screw terminal

Terminal block attachment screws

GX90WD Digital Input/Output Module

M3 screw terminal

Terminal block release levers

WARNING

To prevent electric shock when you attach or remove terminal covers or terminal blocks, be sure that the power supply is turned off.

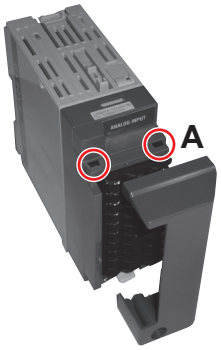
Removing and Attaching a Terminal Cover

Removing the Terminal Cover

Loosen the screw at the bottom section of the terminal cover, and remove the cover.

Attaching the Terminal Cover

1. Insert the two hooks at the top section on the inside of the terminal cover into A, and push the bottom section of the terminal cover.
2. Fasten the screw at the bottom section of the terminal cover to fix the cover in place.
   Recommended tightening torque: 0.6 N•m



The shape of the cover varies depending on the module, but the procedure is the same.

Removing and Attaching a Terminal Block

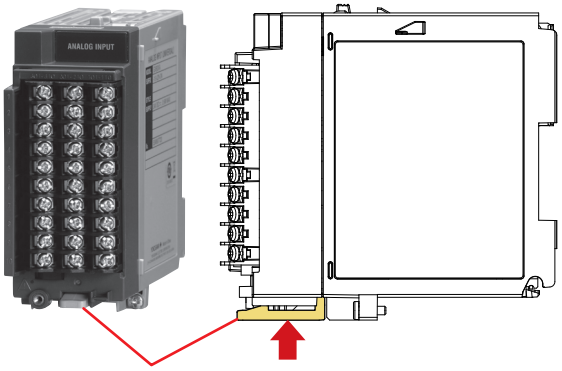
Removing the GX90XA Terminal Block

Push down on the lever at the bottom section of the module, and pull the terminal block out.

Attaching the GX90XA Terminal Block

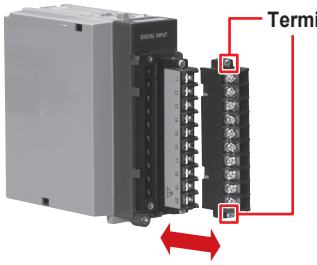
Insert the terminal block into the module, and push the lever firmly against the module (at the position indicated by the arrow in the figure).

Side view of module



Terminal block release lever

For modules other than the GX90XA, you can use the attachment screw to remove and attach them.



Terminal block attachment screws

Recommended torque for tightening the terminal block attachment screws: 0.1 N•m

When you are using the GX/GP for the first time, following the procedure below to quickly start measuring and recording.

Operating Procedure

Product user's manuals can be downloaded or viewed at the following URL;

URL: www.smartdacplus.com/manual/en/

- Manuals for reference
- First Step Guide (IM 04L51B01-02EN) "Installation and Wiring"

Connect the GX60

To connect the GX60.

- First Step Guide (IM 04L51B01-02EN) "Installation and Wiring"

Install modules.

Not required if preinstalled
To connect an GX60, install the modules in the GX60.

- First Step Guide (IM 04L51B01-02EN) "Installation and Wiring"

Connect I/O signals and power.

- First Step Guide (IM 04L51B01-02EN) "Basic Operations"

Turn on the power.

- First Step Guide (IM 04L51B01-02EN) "Reconfiguring the GX/GP"

Make the GX/GP recognize the modules (GX/GP reconfiguration).

- First Step Guide (IM 04L51B01-02EN) "Basic Operations"

Set the date and time.

- First Step Guide (IM 04L51B01-02EN) "Basic Operations"

Configure signal inputs.

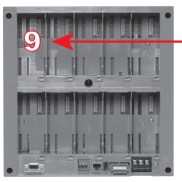
- Paperless Recorder User's Manual (IM 04L51B01-01EN)

Configure functions as necessary.

- First Step Guide (IM 04L51B01-02EN) "Basic Operations"

Start measuring/recording.

1 **Install an expansion module (GX90EX) into the GX/GP.**

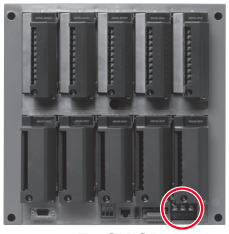


GX90EX

GX10/GP10 : Slot 2
GX20/GP20 : Slot 9

GX10/GP10: Up to 3 modules can be installed.
GX20/GP20: Up to 10 modules can be installed.

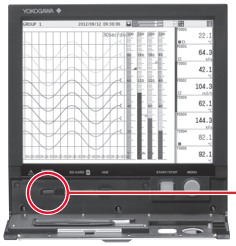
Modules (seven types)



Ex GX/GP

GX60

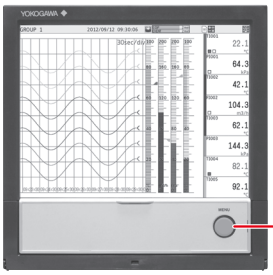
Power inlet on the GP10/GP20/GX60 (power inlet type)



GX60

Power switch

If preinstalled, modules are preconfigured.
If you rearrange the modules or connect the GX60, reconfigure.



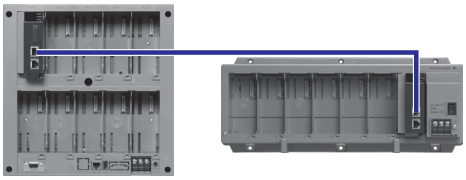
MENU key

2 GX60 address setting

Setting switch (DIP switch)

GX90EX

3 Connect the LAN cable bteween GX/GP and the GX60.



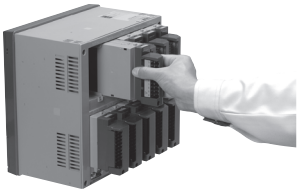
1 Modules not installed

Ex GX/GP

Dummy covers are attached to empty slots (with screws).

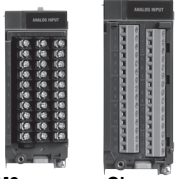
* Recommended tightening torque: 0.6 N•m

2 Insert until a click is heard and fasten with screws.*



3 Modules installed (10 modules)

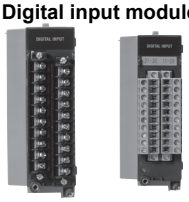
GX90XA
Analog input module



M3 screw terminal

Clamp terminal

GX90XD
Digital input module



M3 screw terminal

Clamp terminal

GX90YD
Digital output module

M3 screw terminal

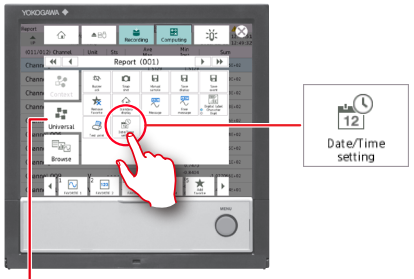
GX90WD
Digital input/output module

M3 screw terminal

WARNING

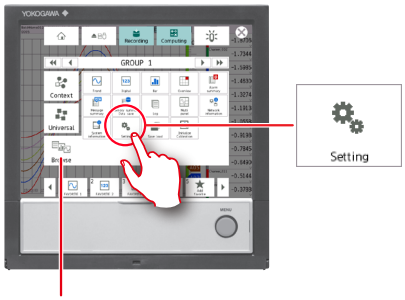
To prevent electric shock when wiring, make sure that the power supply is turned off.

Set the date and time.



Common menu tab

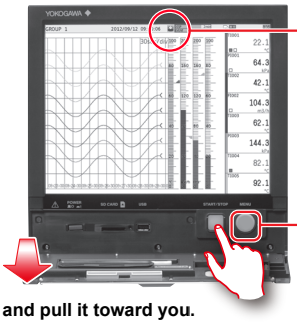
Configure input and functions.



Browse tab

Start measuring/recording.

or



Recording stopped

Recording in progress

Alternates

Lit in blue
Running

(No alarm)

Lit in red
Alarm activated

Off: Power off

To open, push the front door down and pull it toward you.

Installation and Wiring

Installation Location

Install the GX/GP indoors in an environment that meets the following conditions:

- Instrumentation panel
  The GX10/GX20 excluding the portable type (GP10/GP20) is designed to be installed in an instrumentation panel.
- Well-ventilated location
  To prevent overheating, install the GX/GP in a well-ventilated location. For the panel cut dimensions when arranging multiple GXs, see the next page. When other instruments are installed next to the GX, follow the panel cut dimensions to provide adequate space around the GX. In the case of the portable type, we recommend that you provide at least 50 mm of space from the left, right, and top panels.
- Minimal mechanical vibrations
  Install the GX/GP in a location that has minimal mechanical vibrations. Installing the GX/GP in a location that is subject to large levels of mechanical vibration will not only put added stress on its components, it may also impede ordinary measurement.
- Level Location
  Install the GX/GP in a level location so that it is not slanted to the left or the right (however, the GX/GP can be inclined up to 30 degrees backward for panel mounting).

Note

Condensation may form when moving the GX/GP from a low temperature or humidity environment to a high temperature or humidity environment, or when there is a sudden change in temperature. Temperature or humidity changes may also result in thermocouple measurement errors. In these kinds of circumstances, wait for at least an hour before using the GX/GP, to acclimate it to the surrounding environment.
The GP20 may tip over if it is tilted more than 10 degrees, front and back.

Do Not Install the Instrument in the Following Places

- Outdoors
- In direct sunlight or near heat sources
  Install the GX/GP in a place that is near room temperature (23°C) and that is not subject to large temperature fluctuations. Placing the GX/GP in direct sunlight or near heat sources can cause adverse effects on the internal circuitry.
- Where an excessive amount of soot, steam, moisture, dust, or corrosive gases are present
  Soot, steam, moisture, dust, and corrosive gases will adversely affect the GX/GP. Avoid installing the GX/GP in such locations.
- Near strong magnetic field sources
  Do not bring magnets or instruments that produce electromagnetic fields close to the GX/GP. Operating the GX/GP near strong magnetic fields can cause measurement errors.
- Where the display Is difficult to see
  The GX/GP uses an LCD screen, so it is difficult to view the display from an extreme angle. Install the GX/GP so that the user can view the display directly from the front.

Installation Procedure

CAUTION

- **Using more than the appropriate torque to tighten the screws can deform the case or damage the brackets.**
- **Be sure not to insert foreign objects or tools into the case through the mounting bracket holes.**
- **When you attach the rubber packing, be sure that no portion of it gets wedged between the GX and the panel. If the rubber packing is not attached properly, you will not be able to achieve sufficient dust proofing or waterproofing.**

Installation Procedure for the GX10/GX20

Use a steel panel that is 2 mm to 26 mm thick.

1. Insert the GX through the front of the panel.
2. Mount the GX to the panel using the included mounting brackets as described below.

- Use two mounting brackets to support the top and bottom or the left and right sides of the case (remove the stickers that are covering the holes before you attach the brackets).
- The recommended tightening torque for the mounting screws is 0.7 to 0.9 N•m.
- Follow the procedure below to mount the GX to the panel.
  - First, attach the two mounting brackets and temporarily tighten the mounting screws.
  - Next, fix the GX in place by tightening the mounting screws with the appropriate torque. When the GX is approximately perpendicular to the panel, press the mounting brackets so that they are in contact with the case, and fully tighten the mounting screws.

Note

To achieve sufficient dust proofing and waterproofing, mount the GX in the middle of the panel cut out.

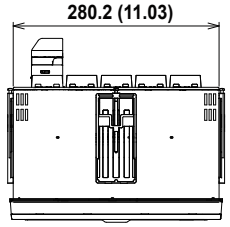
Installation Procedure for the GX60

Use a steel panel that is at least 2 mm thick.

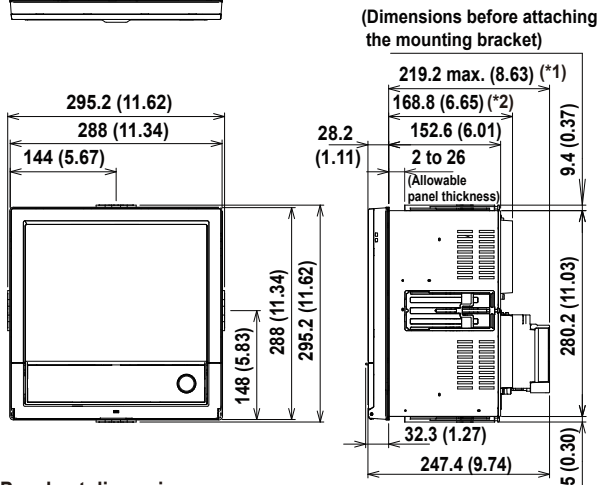
1. Make 6 holes in the panel for the six M4 screws.
2. Fix the unit in place by fastening M4 screws to the six mounting screw holes. The recommended tightening torque for the screws is 0.7 to 0.9N•m.

External Dimensions and Panel Cut Dimensions

GX20 External Dimensions

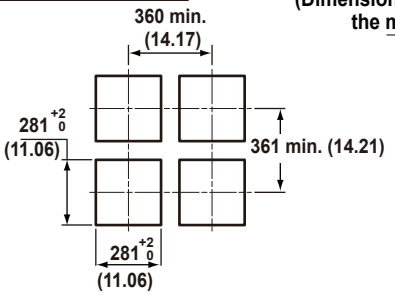


Unit: mm (approx. inch)
Unless otherwise specified, tolerance is ±3% (however, tolerance is ±0.3 mm when below 10 mm).

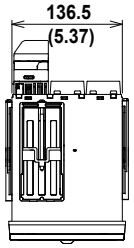


*1: With modules
*2: Without modules

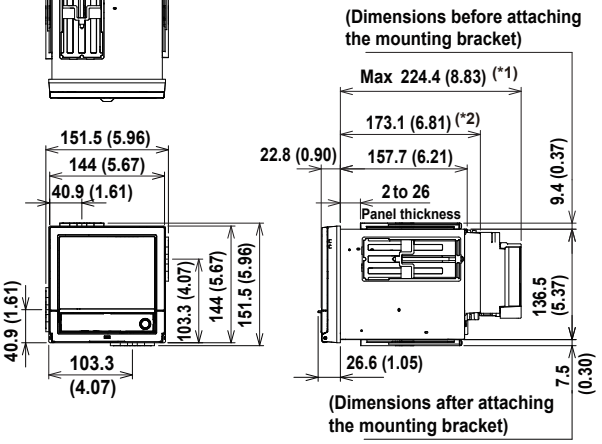
Panel cut dimensions



GX10 External Dimensions

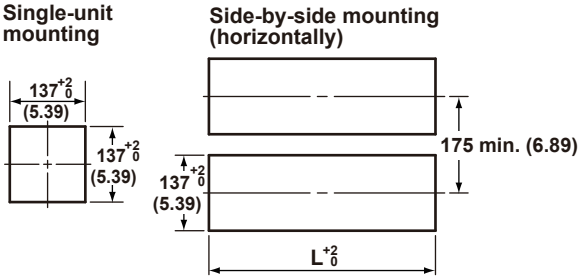


Unit: mm (approx. inch)
Unless otherwise specified, tolerance is ±3% (however, tolerance is ±0.3 mm when below 10 mm).

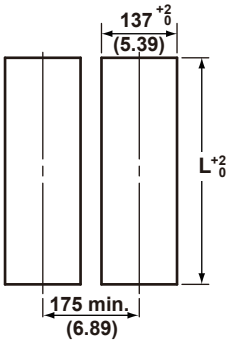


*1: With modules
*2: Without modules

Panel cut dimensions

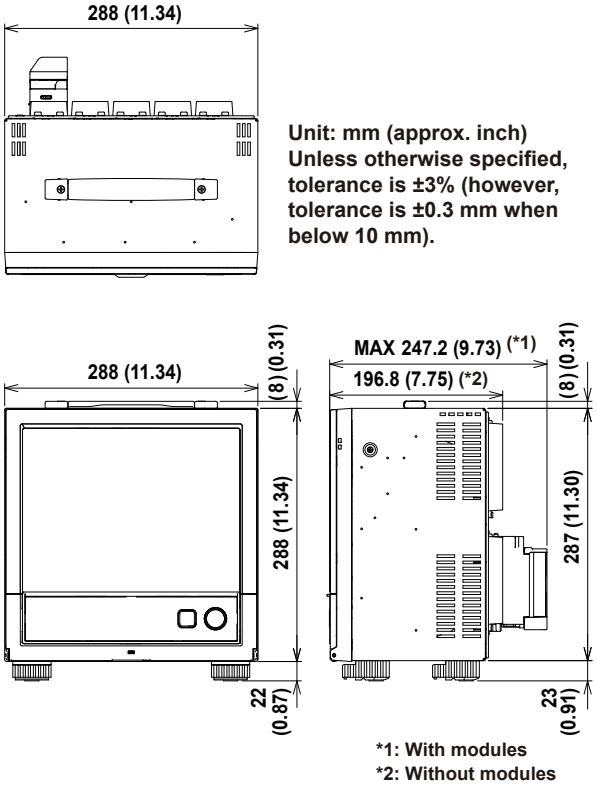


Side-by side mounting (vertically; max. 3 units)



Units	L +2 0
2	282 (11.10)
3	426 (16.77)
4	570 (22.44)
5	714 (28.11)
6	858 (33.78)
7	1002 (39.45)
8	1146 (45.12)
9	1290 (50.79)
10	1434 (56.46)
n	(144×n)-6

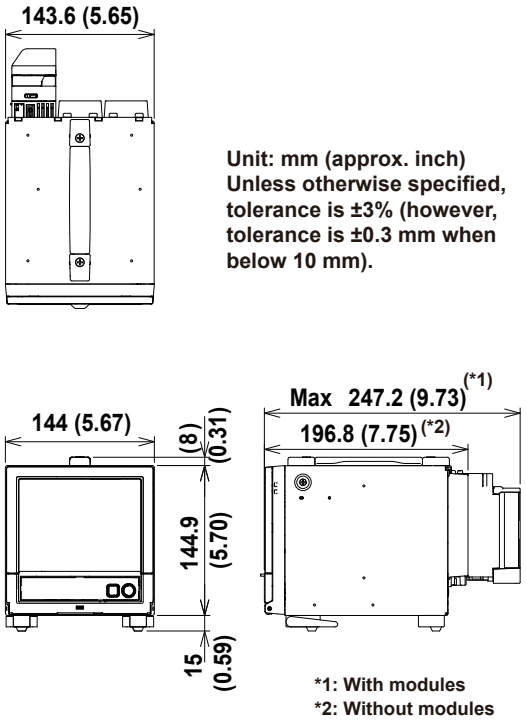
GP20 External Dimensions



Unit: mm (approx. inch)
Unless otherwise specified, tolerance is ±3% (however, tolerance is ±0.3 mm when below 10 mm).

***1: With modules**
***2: Without modules**

GP10 External Dimensions



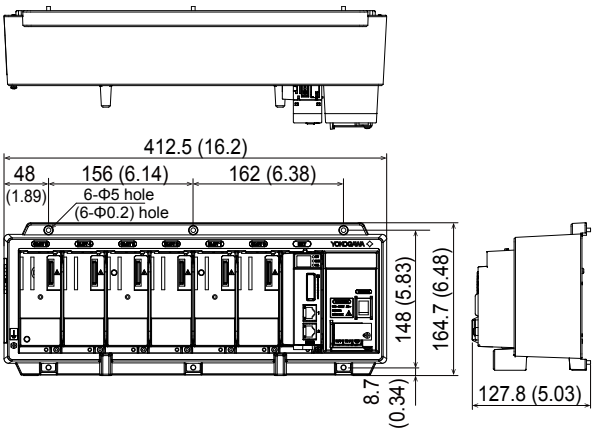
Unit: mm (approx. inch)
Unless otherwise specified, tolerance is ±3% (however, tolerance is ±0.3 mm when below 10 mm).

***1: With modules**
***2: Without modules**

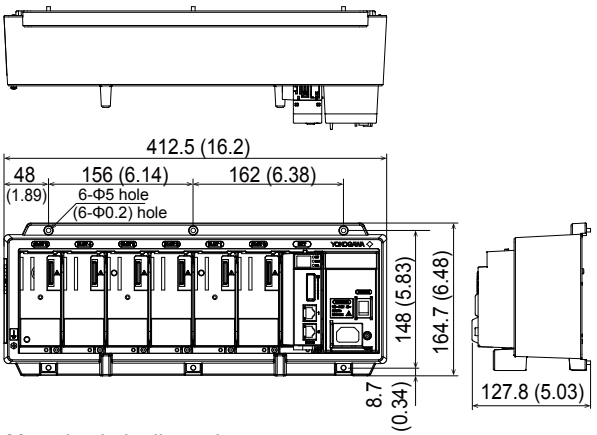
When using the stand, the GP10 will face 12 degrees upward.

GX60 Dimensions

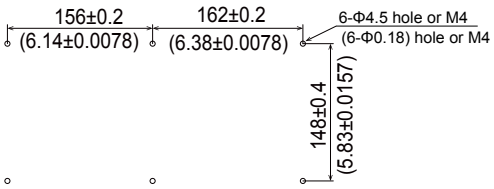
Power supply terminal type



Power inlet type



Mounting hole dimensions



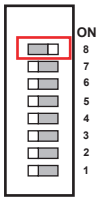
Unit: mm (approx. inch)
Unless otherwise specified, tolerance is ±3% (however, tolerance is ±0.3 mm when below 10 mm).

Connect an GX60

Installing an Expansion Module into the GX/GP

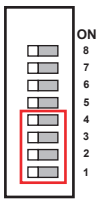
When installing an expansion module into the GX/GP or setting dipswitches, turn off the GX/GP and the GX60.

1. Install an expansion module into slot 9 or 2 of the GX/GP.
2. Set dipswitch 8 of the expansion module to “ON” (master).
   Set the unit number to 0.
   (Default: 0)



Setting the Unit Number of the GX60

The factory default unit number of the expansion module is 0. Use dipswitches 1 to 4 to set the unit number (1 to 6).



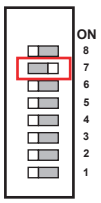
Unit number and dipswitch setting

Unit number	Dipswitch			
	1	2	3	4
6	OFF	ON	ON	OFF
5	ON	OFF	ON	OFF
4	OFF	OFF	ON	OFF
3	ON	ON	OFF	OFF
2	OFF	ON	OFF	OFF
1	ON	OFF	OFF	OFF
0[1]	OFF	OFF	OFF	OFF

1 The factory default setting. Unit number “0” is reserved for the expansion module that is installed into the GX/GP.

Fixing the Data Rate to 10 Mbps

To fix the data rate to 10 Mbps, set dipswitch 7 to “ON”.



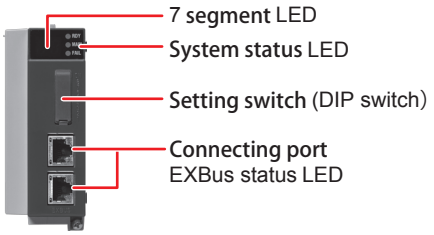
7-segment LED for
10 Mbps fixed mode

Dot indication

Connect an GX60

Connect the expansion module installed in the GX/GP to the expansion modules of each expansion unit using Ethernet STP (shielded) cables.
Only cascaded connection is supported.

Functions of Expansion Module Components



7 segment LED

Displays the unit number and operation errors of the GX/GP and GX60

- Unit number indication
  Displays the unit number (00 to 06).
- Operation error indication
  Displays error codes. Ex (where x is a one digit number or an alphabet letter) will blink. For the error codes, see “Expansion Module Error Codes” at the end of this document.

  * If an “Fx” indication is displayed, servicing is necessary. Contact your nearest YOKOGAWA dealer for repairs.

System Status Display LED

Three LEDs indicate the operating status of the expansion module.

Status display LED	Color	Description
RDY	Green	Illuminates during normal operation. Turns off when during a failure.
MASTER	Green	Illuminates during master I/O expansion operation.
FAIL	RED	Illuminates during an error.

Setting Switches (Dipswitches)

Use the dipswitches to set the unit number of the GX60, 10 Mbps fixed mode, and operation mode.

Dipswitch settings

Dipswitch	Description
8	Switches between master I/O expansion and slave I/O expansion mode
7	10 Mbps/100Mbps
6	Always OFF (cannot be changed)
5	Always OFF (cannot be changed)
4	For unit number
3	
2	
1	

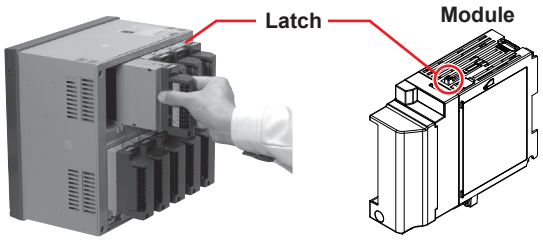
Port

The port is used to connect the GX60 to the GP/GX. Only cascaded connection is supported.

Installing and Removing I/O Modules

Installing a Module

1. As shown below, insert the module into the GX/GP slot and the GX60 slot.
2. Push the module in until you hear a click. Then, fasten the screw at the bottom section of the module.*



Ex. GX/GP

* Recommended torque for tightening the screws: 0.6 N•m

Removing a Module

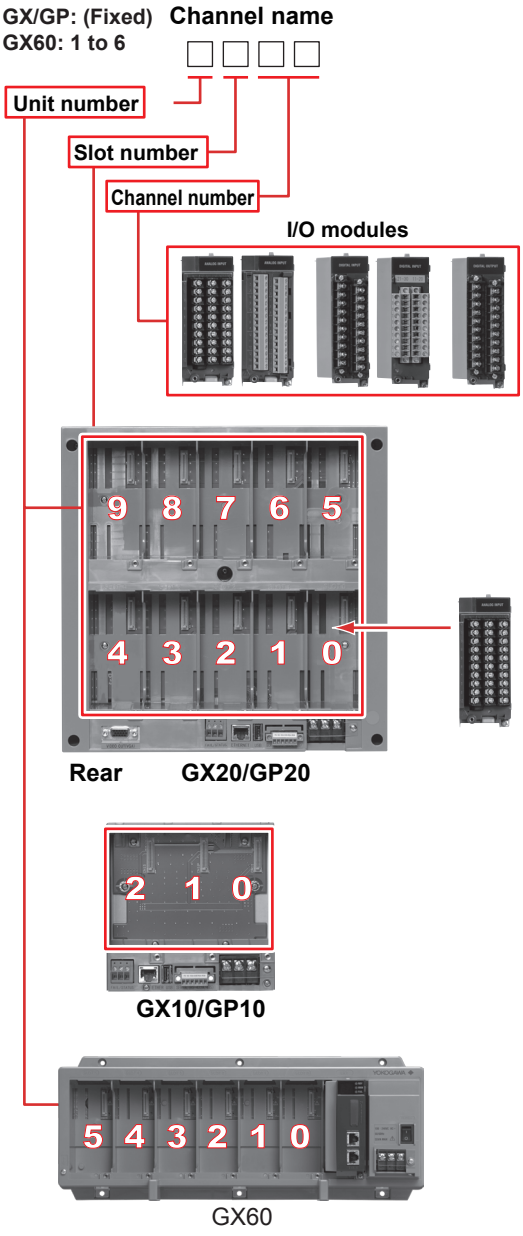
1. Loosen the screw at the bottom section of the module.
2. While pressing down on the latch at the top of the module, pull the module out.

Note

If you want to use the GX/GP's reference junction compensation with the thermocouple input of the GX90XA module, do not install the module for the GX90XA-10-C1 mA or the GX90WD Digital I/O Module into the slot on the right side of GX90XA module (slot with the smaller number) as seen from the rear panel. Doing so may cause the reference junction compensation accuracy to deviate from the guaranteed range.

Channel Names

A channel name consists of a unit number, slot number, and channel number.



Wiring

WARNING

- **To prevent electric shock while wiring, make sure that the power supply is turned off.**
- **If a voltage of more than 30 VAC or 60 VDC is to be applied to the output terminals, use ring-tongue crimp-on lugs with insulation sleeves on all terminals to prevent the signal cables from slipping out when the screws become loose. Furthermore, use double-insulated cables (dielectric strength of 2300 VAC or more) for the signal cables on which a voltage of 30 VAC or 60 VDC or more is to be applied. For all other signal cables, use basic insulated cables (dielectric strength of 1390 VAC). To prevent electric shock, attach the terminal cover after wiring and make sure not to touch the terminals.**
- **Applying a strong tension to the input and output signal cables connected to the GX/GP may damage the cables or the GX/GP terminals. To avoid applying tension directly to the terminals, fix all cables to the rear of the mounting panel.**
- **To prevent fire, use signal cables with a temperature rating of 70°C or more.**
- **To avoid damage to the GX/GP, do not apply voltages that exceed the following values to the input terminals.**

GX90XA
- **Maximum input voltage: ±60 VDC (However, current (mA) input (type suffix code: -C) : ±10V DC)**
- **Maximum common mode voltage: ±60 VDC (under measurement category II conditions)**

GX90XD
- **Maximum input voltage: +10 VDC**
- **Maximum common mode voltage: ±50 VDC**

The GX/GP is an installation category II product.

Precautions to Be Taken While Wiring

Take the following precautions when wiring the input signal cables.

- With a screw terminal, we recommend that you use a crimp-on lug with an insulation sleeve (M4 for power supply wiring, M3 for signal wiring).

Crimp-on lug with an insulation sleeve

Recommended signal wiring crimp-on lug	N1.25-MS3 (JST Mfg. Co., Ltd.)

- With a clamp terminal, we recommend the following wire.

GX90XA

Cross-sectional area	0.05 mm^2 to 1.5 mm^2 (AWG30 to 16)
Stripped wire length	5 to 6 mm

GX90XD

Cross-sectional area	0.2 mm^2 to 1.5 mm^2 (AWG24 to 16)
Stripped wire length	9 to 10 mm

RS-422/485 (/C3 option)

Cross-sectional area	0.08 mm^2 to 1.5 mm^2 (AWG28 to 16)
Stripped wire length	6 to 7 mm

FAIL output/status output (/FL option)

Cross-sectional area	0.33 mm^2 to 2.0 mm^2 (AWG22 to 14)
Stripped wire length	10 to 11 mm

- Take measures to prevent noise from entering the measurement circuit.
  - Move the measurement circuit away from the power cable (power circuit) and ground circuit.
  - Ideally, the object being measured should not generate noise. However, if this is unavoidable, isolate the measurement circuit from the object. Also, ground the object being measured.
  - Shielded wires should be used to minimize the noise caused by electrostatic induction. Connect the shield to the ground terminal of the GX/GP as necessary (make sure you are not grounding at two points).
  - To minimize noise caused by electromagnetic induction, twist the measurement circuit wires at short, equal intervals.
  - Make sure to earth ground the protective ground terminal through minimum resistance.
- When using internal reference junction compensation on the thermocouple input, take measures to stabilize the temperature at the input terminal.
  - Always use the terminal cover.
  - Do not use thick wires which may cause large heat dissipation (we recommend a cross sectional area of 0.5 mm^2 or less).
  - Make sure that the ambient temperature remains reasonably stable. Large temperature fluctuations can occur if a nearby fan turns on or off.
- Connecting the input wires in parallel with other devices can cause signal degradation, affecting all connected devices. If you need to make a parallel connection, then
  - Turn the burnout detection function off.
  - Ground the instruments to the same point.
  - Do not turn ON or OFF another instrument during operation. This can have adverse effects on the other instruments.
  - RTDs cannot be wired in parallel.

Wiring Procedure

A terminal cover is screwed in place on the I/O terminal block. A label indicating the terminal arrangement is affixed to the cover.

1. Turn off the GX/GP/GX60, and remove the terminal cover.
2. Connect the signal cables to the terminals.

Recommended torque for tightening the screws	Screw terminal (M3)	0.5 to 0.6 N•m
	Clamp terminal	GX90XA: 0.4 N•m
		GX90XD: 0.5 N•m

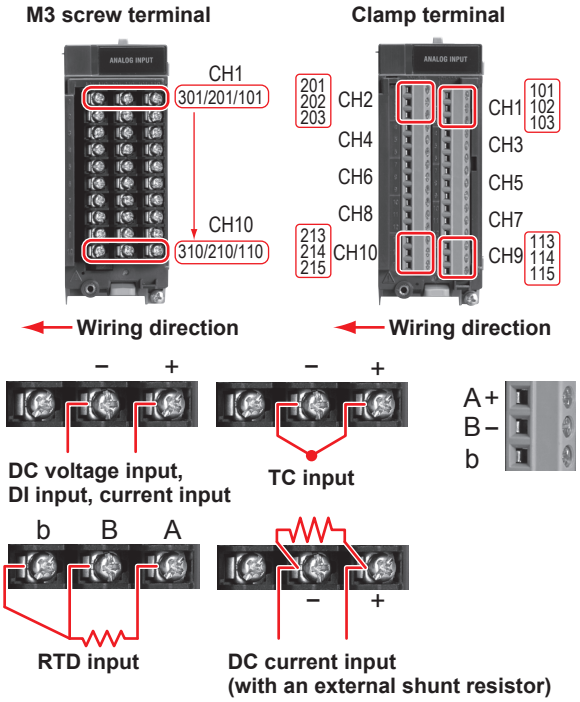
3. Attach the terminal cover and fasten it with screws. The appropriate tightening torque for the screws is 0.6 N•m.

Note

With a clamp terminal, if you use a single wire whose diameter is 0.3 mm or less, you may not be able to clamp the wire securely to the terminal. Take measures to securely clamp the wire such as by folding the conductor section that will be connected to the clamp terminal in half.

Wiring to a GX90XA Analog Input Module

Terminal Diagram



Terminal Arrangement

M3 screw terminal

CH No.	Term. No.	Symbol	Term. No.	Symbol	Term. No.	Symbol
CH1	301	b[1]	201	-/B	101	+/A
CH2	302	b[1]	202	-/B	102	+/A
CH3	303	b[1]	203	-/B	103	+/A
CH4	304	b[1]	204	-/B	104	+/A
CH5	305	b[1]	205	-/B	105	+/A
CH6	306	b[1]	206	-/B	106	+/A
CH7	307	b[1]	207	-/B	107	+/A
CH8	308	b[1]	208	-/B	108	+/A
CH9	309	b[1]	209	-/B	109	+/A
CH10	310	b[1]	210	-/B	110	+/A

1 There are no symbol indications for the electromagnetic relay type, current input type, or low withstand voltage scanner type.

Clamp terminal

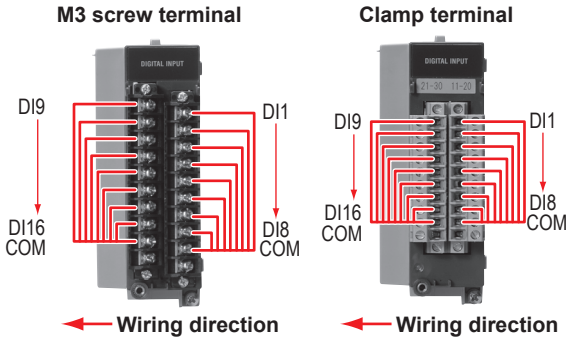
CH No.	Term. No.	Symbol	CH No.	Term. No.	Symbol
CH2	201	+/A	**CH1**	101	+/A
	202	-/B		102	-/B
	203	b[1]		103	b[1]
CH4	204	+/A	**CH3**	104	+/A
	205	-/B		105	-/B
	206	b[1]		106	b[1]
CH6	207	+/A	**CH5**	107	+/A
	208	-/B		108	-/B
	209	b[1]		109	b[1]
CH8	210	+/A	**CH7**	110	+/A
	211	-/B		111	-/B
	212	b[1]		112	b[1]
CH10	213	+/A	**CH9**	113	+/A
	214	-/B		114	-/B
	215	b[1]		115	b[1]

1 There are no symbol indications for the electromagnetic relay type, current input type, or low withstand voltage relay type.

The RTD b terminal is connected internally.
There are no RTD inputs on the electromagnetic relay type.

Wiring to a GX90XD Digital Input Module

Terminal Diagram



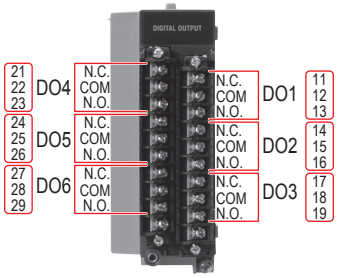
Terminal Arrangement

Term. No.	Symbol	Term. No.	Symbol
21	DI9	11	DI1
22	DI10	12	DI2
23	DI11	13	DI3
24	DI12	14	DI4
25	DI13	15	DI5
26	DI14	16	DI6
27	DI15	17	DI7
28	DI16	18	DI8
29	COM	19	COM
30	-	20	-

Wiring to a GX90YD Digital Output Module

Terminal Diagram

M3 screw terminal



Wiring direction

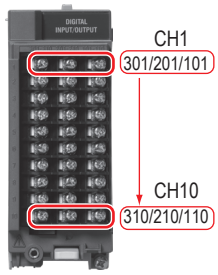
Terminal Arrangement

DO No.	Term. No.	Symbol	DO No.	Term. No.	Symbol
DO4	21	NC	DO1	11	NC
	22	COM		12	COM
	23	NO		13	NO
DO5	24	NC	DO2	14	NC
	25	COM		15	COM
	26	NO		16	NO
DO6	27	NC	DO3	17	NC
	28	COM		18	COM
	29	NO		19	NO
	30	-		20	-

Wiring to a GX90WD Digital Input /Output Module

Terminal Diagram

M3 screw terminal



Wiring direction

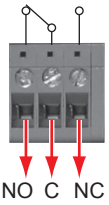
Terminal Arrangement

CH No.	Term. No.	Symbol	Term. No.	Symbol	Term. No.	Symbol
DI1 to DI8	301	DI3	201	DI2	101	DI1
	302	DI6	202	DI5	102	DI4
	303	DICOM	203	DI8	103	DI7
–	304	-	204	-	104	-
DO1	305	DO1NO	205	DO1COM	105	DO1NC
DO2	306	DO2NO	206	DO2COM	106	DO2NC
DO3	307	DO3NO	207	DO3COM	107	DO3NC
DO4	308	DO4NO	208	DO4COM	108	DO4NC
DO5	309	DO5NO	209	DO5COM	109	DO5NC
DO6	310	DO6NO	210	DO6COM	110	DO6NC

Inside dimension of M3 screw terminal block

Unit: mm (approx. inch)

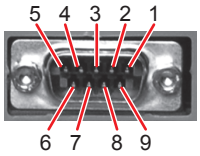
Connecting to the FAIL Output/Status Output (/FL option)



FAIL output	NO C NC During normal operation	NO C NC When a failure occurs	NO C NC When power is turned off
Status output	NO C NC During normal operation	NO C NC When the specified status occurs	NO C NC When power is turned off

Recommended torque for tightening the screws: 0.5N•m

Connecting to the Serial Communication Interface (/C2 option)



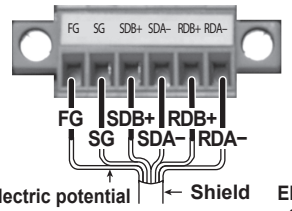
DSUB 9-pin male

2	RD (Received Data)
3	SD (Send Data)
5	SG (Signal Ground)
7	RS (Request to Send)
8	CS (Clear to Send)

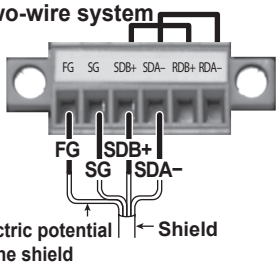
Pins 1, 4, 6, and 9 are not used.

Connecting to the RS-422/485 Connector (/C3 option)

Four-wire system



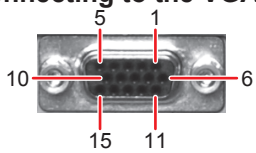
Two-wire system



FG (Frame Ground)	Case ground of the GX/GP
SG (Signal Ground)	Signal ground
SDB+ (Send Data B+)	Send data B (+)
SDA− (Send Data A−)	Send data A (–)
RDB+ (Received Data B+)	Receive data B (+)
RDA− (Received Data A−)	Receive data A (–)

Recommended torque for tightening the screws: 0.2N•m

Connecting to the VGA Connector (/D5 option)



D-Sub 15-pin (Female)

Pin No.	Signal Name	Specifications
1	Red	0.7 Vp-p
2	Green	0.7 Vp-p
3	Blue	0.7 Vp-p
4	—	
5	—	
6	GND	
7	GND	
8	GND	
9	—	
10	GND	
11	—	
12	—	
13	Horizontal sync signal	Approx. 39.1 kHz, TTL negative logic
14	Vertical sync signal	Approx. 60 Hz, TTL negative logic
15		

CAUTION

- **Only connect the GX/GP to a monitor after turning both the GX/GP and the monitor off.**
- **Do not short the VIDEO OUT connector or apply external voltage to it. Doing so may damage the GX/GP.**

Connecting to a Monitor

1. Turn off the GX/GP and the monitor.
2. Connect the GX/GP and the monitor using an RGB cable.
3. Turn on the GX/GP and the monitor. The GX/GP screen appears on the monitor.

Note

- When the GX/GP is turned on, the VIDEO OUT connector constantly transmits VGA signals.
- The monitor display may flicker if you place the GX/GP or some other device close to it.
- Depending on the type of monitor, parts of the GX/GP display may be cut off.

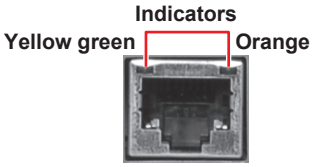
Connecting to the USB Port (/UH option)

A USB2.0 compliant port (see “Component Names”)

Connecting to the Ethernet Port

Checking the Connection and Communication Status

You can use the indicators that are located above the Ethernet port to check the connection status of the Ethernet interface.



Indicator	Connection Status of the Ethernet Interface
Lit (yellow-green)	The Ethernet link is established.
Off (yellow-green)	The Ethernet link is not established.
Blinking (yellow-green)	Receiving data
Lit (orange)	Connected at 100 Mbps
Off (orange)	Connected at 10 Mbps

Wiring the Power Supply

Use a power supply that meets the following conditions:

Item	Condition (Not /P1)	Condition (/P1)
Rated supply voltage	100 to 240 VAC	24 VDC/AC
Allowable power supply voltage range	GX/GP: 90 to 132 VAC,180 to 264 VAC GX60: 90 to 132 VAC,180 to 240 VAC	21.6 V to 26.4 VDC/AC
Rated power supply frequency	50/60 Hz	50/60 Hz (for AC)
Permitted power supply frequency range	50/60 Hz ± 2%	50/60 Hz ± 2% (for AC)
Maximum power consumption 100 VAC (/P1: 24 VDC)	GX10/GP10: 48 VA GX20/GP20: 90 VA GX60: 40VA	GX10/GP10: 24 VA GX20/GP20: 48 VA
Maximum power consumption 240 VAC (/P1: 24 VAC)	GX10/GP10: 60 VA GX20/GP20: 110 VA GX60: 55VA	GX10/GP10: 42 VA GX20/GP20: 76 VA

Note

Do not use a supply voltage of 132 to 180 VAC, as this may have adverse effects on the measurement accuracy.

GP10 Power Supply Suffix Code: 2

Item	Condition
Rated supply voltage	12 VDC
Allowable power supply voltage range	10 V to 20 VDC
Maximum power consumption	26 VA

Precautions to Be Taken When Wiring the Power Supply (GX10/GX20/GX60)

Make sure to follow the warnings below when wiring the power supply. Failure to do so may cause electric shock or damage to the instrument.

WARNING

- **To prevent electric shock, ensure that the power supply is turned off.**
- **To prevent fire, use 600 V PVC insulated wires (AWG20 to AWG16; JISC3307) or wires or cables with equivalent or better performance.**
- **Make sure to earth ground the protective ground terminal through minimum resistance before you turn on the power.**
- **Use crimp-on lugs (designed for 4 mm screws) with insulation sleeves to connect both the power cord and the protective ground.**
- **To prevent electric shock, be sure to close the transparent cover for the power supply wires.**
- **Provide a power switch (double-pole type) on the power supply line to separate the GX/GP from the main power supply. Use labels to indicate that this switch is for cutting off the power supply to the GX/GP and to indicate ON and OFF.**

Switch specifications

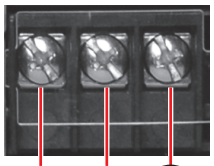
Steady-state current rating	1 A or higher (Not /P1), 3 A or higher (/P1)
Inrush current rating	60 A or higher (Not /P1), 70 A or higher (/P1)

Must comply with IEC60947-1 and IEC60947-3.

- **Do not add a switch or fuse to the ground line.**

Wiring Procedure (GX10/GX20/GX60)

1. Turn off the GX power supply, and then remove the transparent power supply terminal cover.
2. Connect the power cord and the protective ground cord to the power supply terminal. Use ring-tongue crimp-on lugs (for M4 screws) with insulation sleeves. The appropriate tightening torque for the screws is 1.4 to 1.5 N•m.



L(+) N(-) **Protective ground**

3. Attach the transparent power supply terminal cover, and fasten it with screws.

Precautions to Be Taken When Connecting the Power Supply (GP10/GP20/GX60)

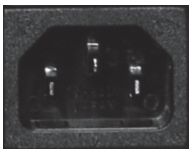
Make sure to follow the warnings below when connecting the power supply. Failure to do so may cause electric shock or damage to the instrument.

WARNING

- **Before connecting the power cord, ensure that the source voltage matches the rated supply voltage of the instrument and that it is within the maximum rated voltage range of the provided power cord.**
- **Connect the power cord after checking that the power switch of the instrument is turned OFF.**
- **To prevent electric shock and fire, be sure to use a power cord purchased from Yokogawa Electric Corporation.**
- **Make sure to connect protective earth grounding to prevent electric shock. Insert the power cord into a grounded three-prong outlet.**
- **Do not use an extension cord without protective earth ground. If you do, the instrument will not be grounded.**

Connection Procedure

1. Check that the GP's power switch is off.
2. Connect the supplied power cord plug to the power inlet on the rear panel of the GP or front panel of the GX60.



3. Ensure that the source voltage is within the maximum rated voltage range of the provided power cord. Then, connect the other end of the cord to the outlet. Use a grounded three-prong outlet.

Precautions to Be Taken When Connecting the Power Supply (GP10 Power supply Suffix Code: 2)

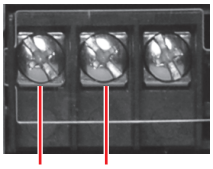
Make sure to follow the warnings below when connecting the power supply. Failure to do so may cause damage to the instrument.

WARNING

- **Wire the power cable to the power supply terminal, making sure that the polarity is correct.**
- **Connect the power cables after checking that the power switch of the instrument is turned OFF.**
- **Using other wires may cause abnormal heating or fire.**

Wiring Procedure (GP10 Power supply Suffix Code: 2)

1. Turn off the GP power supply, and then remove the transparent power supply terminal cover.
2. Wire the power cable to the power supply terminal, making sure that the polarity is correct.
   Use ring-tongue crimp-on lugs (for M4 screws) with insulation sleeves. The appropriate tightening torque for the screws is 1.4 to 1.5 N•m.
   Use 600 V PVC insulated wires (AWG20 to AWG16; JISC3307) or wires or cables with equivalent or better performance.



(+) (-)

3. Attach the transparent power supply terminal cover, and fasten it with screws.

Basic Operation

Turning the Power On and Off

Turning the Power On

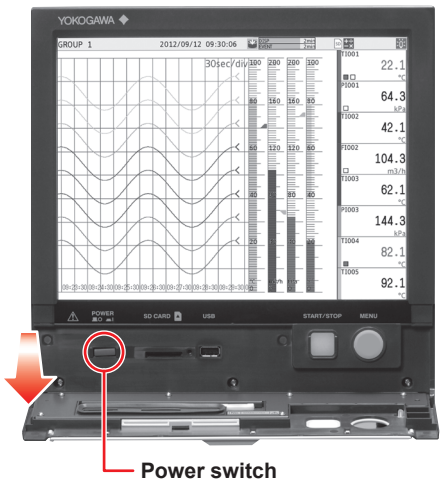
CAUTION

Check the following points before turning on the power switch.
- **The power cord or wires are connected properly to the GX/GP and GX60.**
- **The GX/GP is connected to the correct power supply.**

If the input wiring is connected in parallel with another instrument, do not turn on or off the GX/GP/GX60 or other instrument during operation. If you do, measured values may be affected.

GX/GP

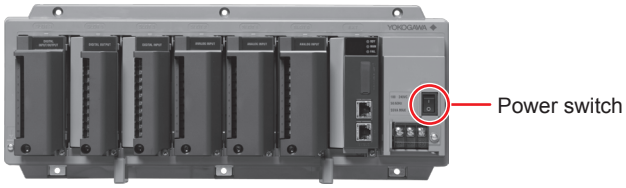
1. Open the front door.
2. Turn on the power switch.
   A self-test takes place for a few seconds, and then the operation screen appears.



3. Close the front door.

GX60

Turn on the power switch.



CAUTION

- **If nothing appears on the display even when you turn on the power switch, turn off the power switch, and check the wiring and supply voltage. If, after checking these items, the GX/GP still fails to start when you turn on the power switch, it may be malfunctioning. Contact your nearest Yokogawa dealer for repairs.**
- **If an error message appears on the screen, take measures according to the information in chapter 5, “Troubleshooting” in the GX/GP User’s Manual.**
- **After you turn on the power switch, allow the GX/GP to warm up for at least 30 minutes before starting a measurement.**

Turning the Power Off

CAUTION

Check the following points before turning off the power switch.
- **The external storage medium is not being accessed (the yellow-green LED is not blinking).**

GX/GP

1. Open the front door.
2. Turn off the power switch.
3. Close the front door.

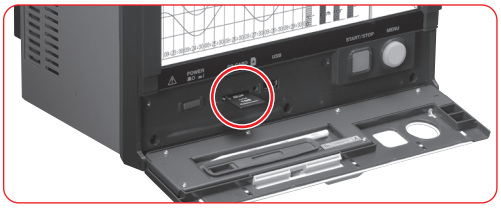
GX60

Turn off the power switch.

Setting and Removing SD Memory Cards

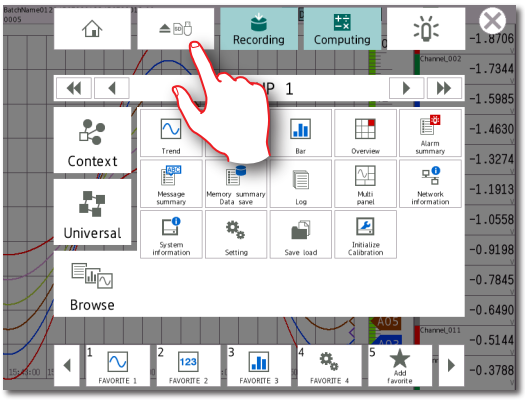
Setting a SD Memory Card

1. Open the front door.
2. Insert an SD memory card into the card slot.



Removing the SD Memory Card

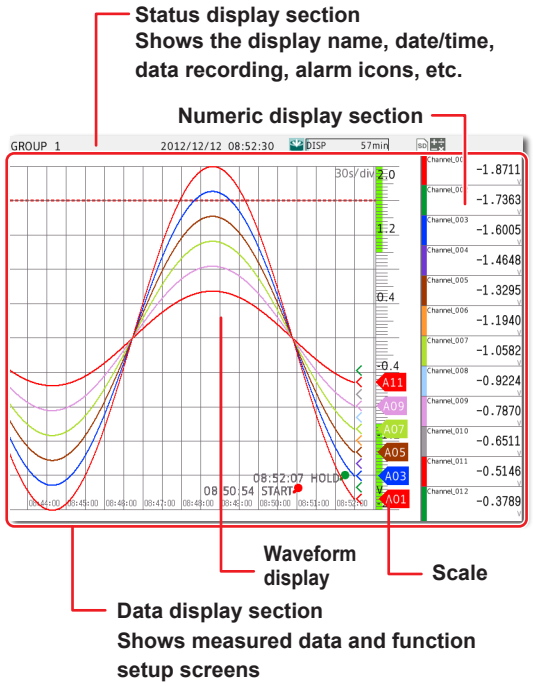
1. Press **MENU**.
2. Tap the media eject icon.



3. On the screen for selecting the type of media, tap **SD**.
4. Remove the SD memory card.

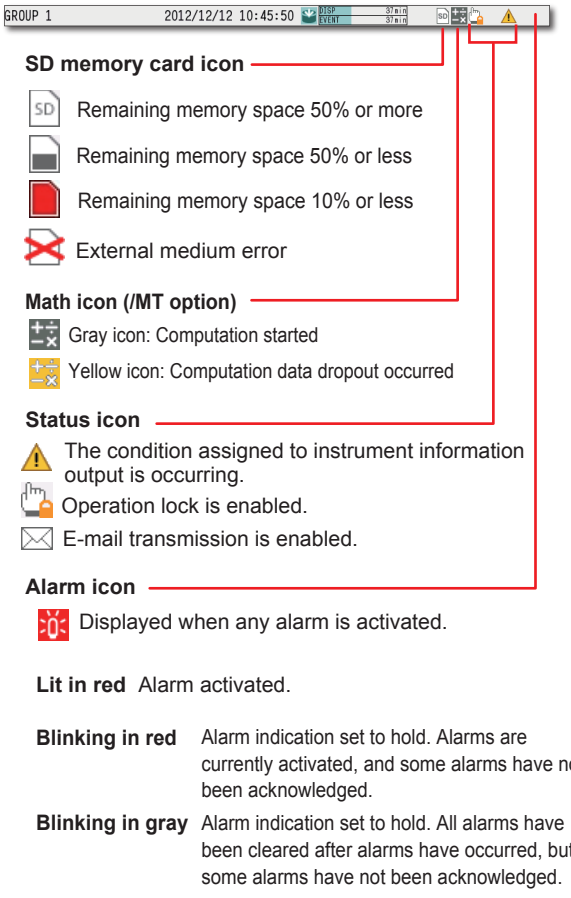
Operation complete

Viewing the Operation Screen (Trend)



Status Display Section

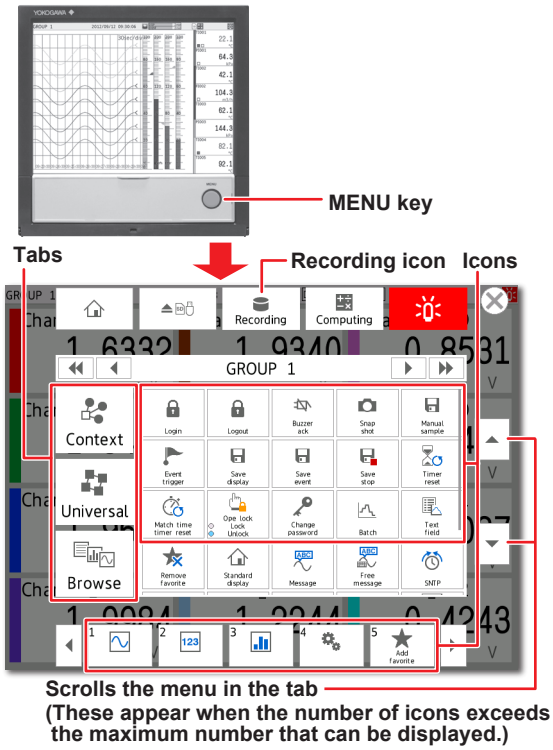
GROUP 1
2012/12/12 10:45:50
Date and time
Recording status icon
Recording in progress
Recording stopped
Data type
DISP: Display data
EVENT: Event data
Recording progress
Displays the progress using a green bar graph. The frame indicates the saving interval (display data) or data length (event data).
DISP
Internal memory error
Display name or group name
When using the batch function
2012/12/12 10:14:07
When using the login function
2012/12/12 10:17:54
When using the login and batch functions


GROUP 1
2012/12/12 10:45:50
SD memory card icon
Remaining memory space 50% or more
Remaining memory space 50% or less
Remaining memory space 10% or less
External medium error
Math icon (/MT option)
Gray icon: Computation started
Yellow icon: Computation data dropout occurred
Status icon
The condition assigned to instrument information output is occurring.
Operation lock is enabled.
E-mail transmission is enabled.
Alarm icon
Displayed when any alarm is activated.
Lit in red Alarm activated.
Blinking in red Alarm indication set to hold. Alarms are currently activated, and some alarms have not been acknowledged.
Blinking in gray Alarm indication set to hold. All alarms have been cleared after alarms have occurred, but some alarms have not been acknowledged.

Displaying the Menu Screen

To change the display between various setup screens and operation screens, display the menu screen.

1 Press **MENU**.
The menu screen appears.

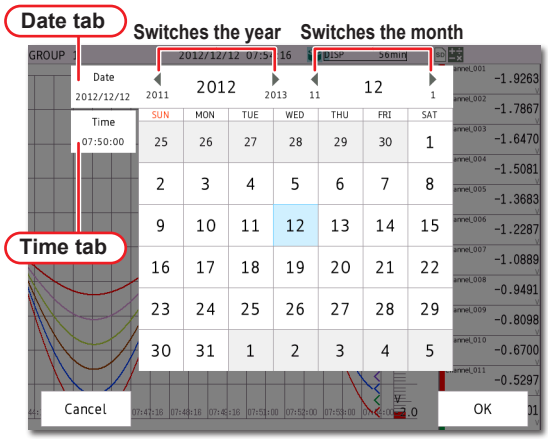


Setting the Date and Time

Set the date using the calendar and the time.

Path **MENU key** > **Universal** tab > **Date/Time settings**

1 Tap the Date tab.
2 Set the month and day with the switch icons.



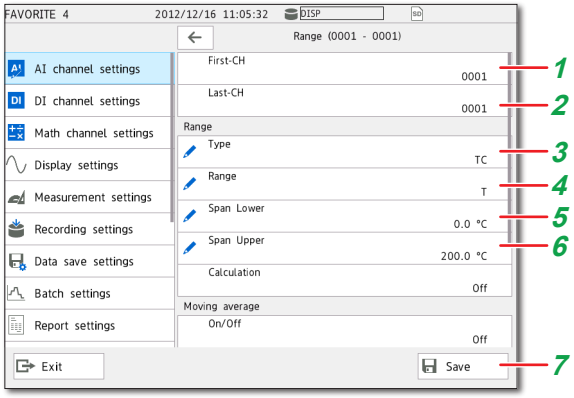
3 Tap the Time tab.
4 Enter the time using the keyboard, and tap **OK**.
The time is set.

Operation complete

Configuring the Inputs

For channel 1 (0001) of slot 0, set thermocouple type T, 0 to 200°C.

Path **MENU** key > **Browse** tab > **Setting** > Setting menu > **AI channel settings** > **Range**

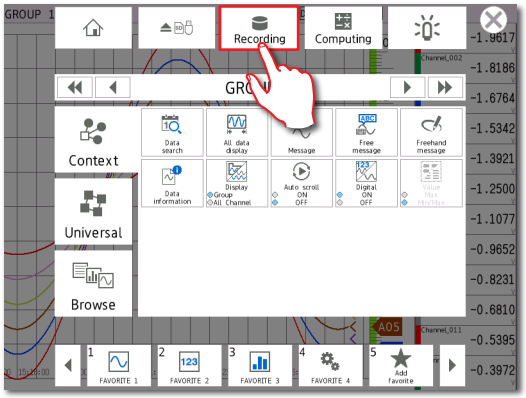


1 Tap **First-CH** > **0001**.
2 Check that Last-CH is 0001.
3 Tap **Type** > **TC**.
4 Tap **Range** > **T**.
5 Tap **Span Lower**, and enter 0.0.
6 Tap **Span Upper**, and enter 200.0.
7 Tap **Save**.

Operation complete

Starting Measurement and Recording

1 Press **MENU**.
The menu screen appears.



2 Tap the **Recording** icon.
The record start screen appears.

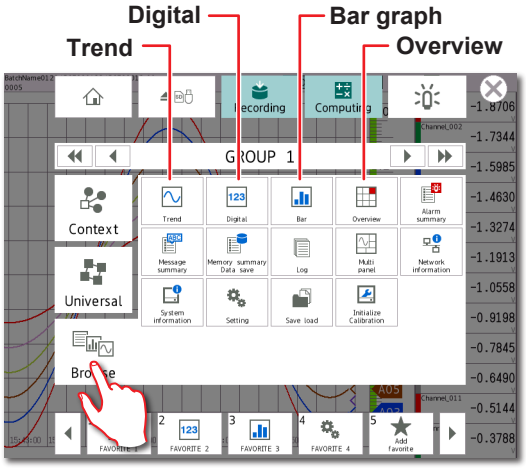
3 Tap **Record**.
Recording starts. The recording status icon in the status display section changes to recording in progress.

Operation complete

You can also start recording with the START/STOP key.
You can stop recording in the same way that you start recording.

Switching between Operation Screens

1 Press **MENU**.
The menu screen appears.



2 Tap the **Browse** tab.

3 Tap the icon of the display that you want to change to.

Operation complete

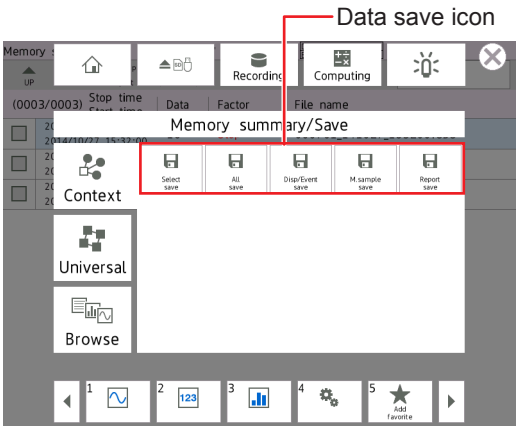
Saving Data to USB Memory

1 Set the USB memory.
The Media operation screen appears.

2 Tap the **Memory save Data save** icon.
The Memory summary / Save screen appears.

3 Press **MENU**.
The menu screen appears.

4 Tap the **Context** tab.
Each data save icon appears.



5 Tap data save icon to save.
The data save screen appears.

6 Select the **USB**, and tap **OK**.
The data is save to USB memory.

Operation complete

This section explains how to change various settings.
Before you change settings, stop recording and computation.

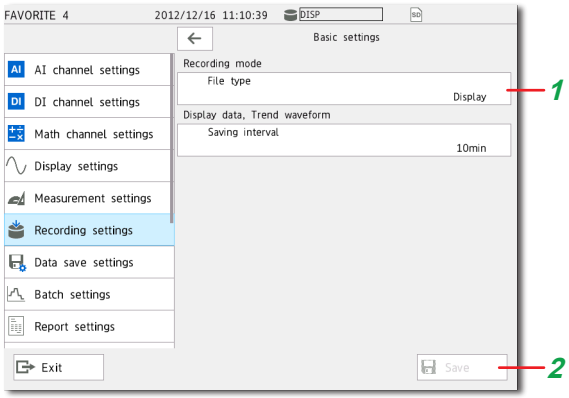
Advanced Operation (Various settings and operation)

Setting Measurement and Recording Conditions

Configuring the type of data to record to display data, the scan interval to 2 s, and the trend interval to 1 min.

Setting the Type of Data to Record

Path **MENU** key > **Browse** tab > **Setting** > Setting menu > **Recording Settings** > **Basic settings**

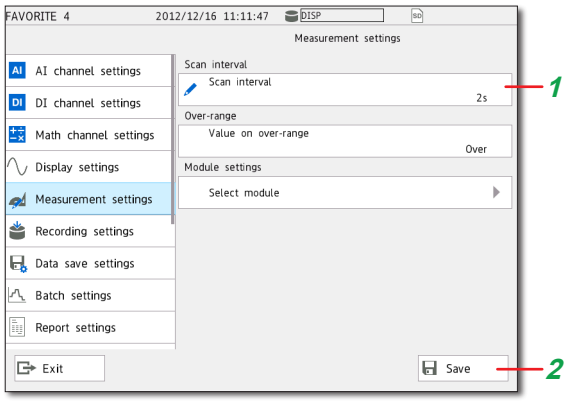


1 Tap **File type** > **Display**.
2 Tap **Save**.

You can set the file type to record only the data that suits your purpose. For example, you can record detailed data or record data only when alarms occur. For details, see the User's Manual (IM 04L51B01-01EN).

Setting the Scan Interval

Path **MENU** key > **Browse** tab > **Setting** > Setting menu > **Measurement settings** > **Scan interval**

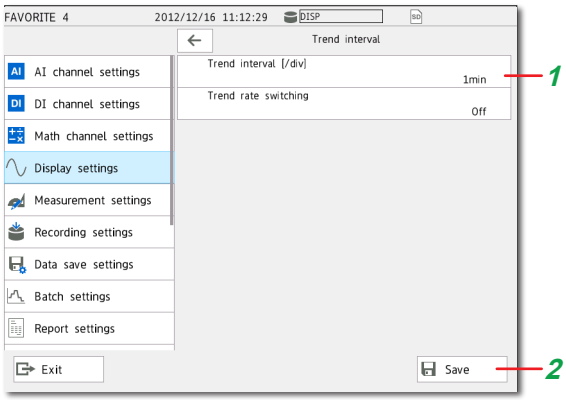


1 Tap **Scan interval** > **2s**.
2 Tap **Save**.

Operation complete

Setting the Trend Interval

Path **MENU** key > **Browse** tab > **Setting** > Setting menu > **Display settings** > **Trend interval**



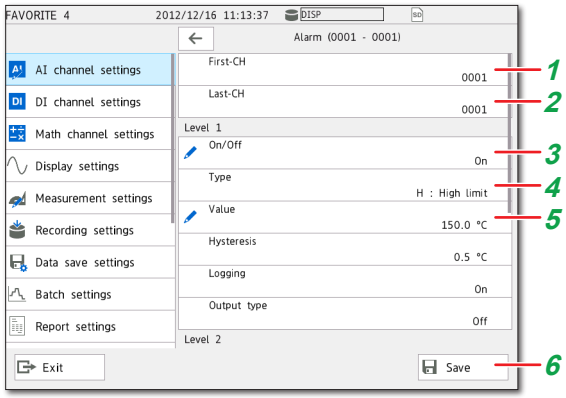
1 Tap **Trend interval [/div]** > **1 min**.
2 Tap **Save**.

Operation complete

Setting Alarms

On channel 1 of slot 0, set the high limit alarm at the alarm value of 150°C.

Path **MENU** key > **Browse** tab > **Setting** > Setting menu > **AI channel settings** > **Alarm**



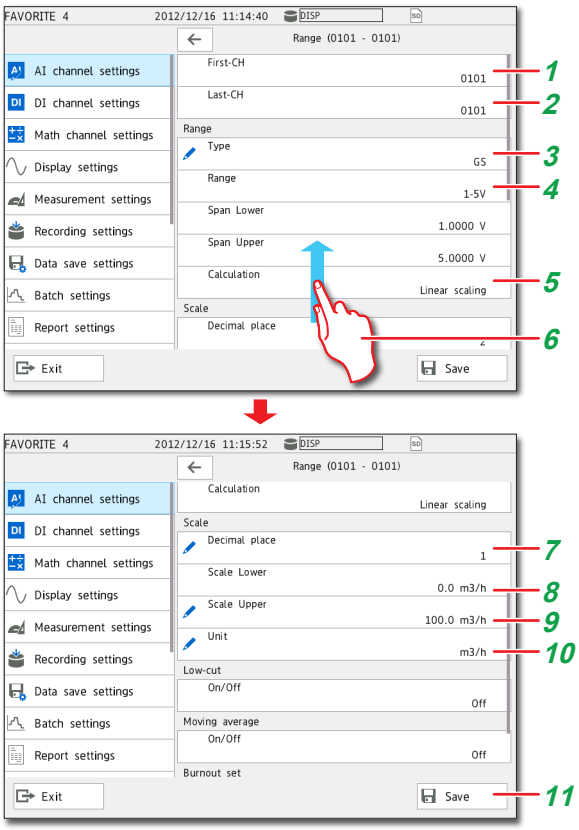
1 Tap **First-CH** > **0001**.
2 Check that **Last-CH** is 0001.
3 Tap **Level1** > **On**.
4 Tap **Type** > **H**.
5 Tap **Value**, and enter 150.0.
6 Tap **Save**.

Operation complete

Using the Scaling Function (Measuring a flow meter)

On channel 1 of slot 1 (0101), measure the input signal ranging from 1 to 5 VDC as 0.0 to 100.0 m^3/h.

Path **MENU** key > **Browse** tab > **Setting** > Setting menu > **AI channel settings** > **Range**



1. Tap **First-CH** > **0101**.
2. Check that **Last-CH** is 0101.
3. Tap **Type** > **GS**.
4. Tap **Range** > **1-5V**.
5. Tap **Calculation** > **Linear scaling**.
6. Drag the screen up.
   Show the setting parameters off the screen at the bottom.
7. Tap **Decimal place** > **1**.
8. Tap **Scale Lower**, and enter 0.0.
9. Tap **Scale Upper**, and enter 100.0.
10. Tap **Unit**, and enter m3/h.
11. Tap **Save**.

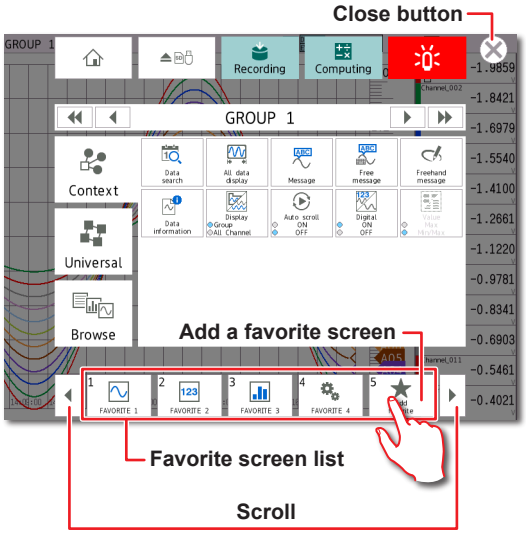
Operation complete

Registering and Deleting Favorite Screens

You can register displays that you use frequently as favorite screens and display them with easy operation. You can register up to 20 displays.

Registering a Favorite Screen

1. Show the display that you want to register as a favorite screen.
2. Press **MENU**.
   The menu screen appears.



3. Tap **Add favorite**.
   A confirmation screen appears.
4. Tap **Favorite name**, and enter the name.
5. Tap **OK**.
   The display is registered.
6. Tap the **Close** icon.
   The screen closes.

Operation complete

Deleting a Favorite Screen

1. Press **MENU**.
2. Tap **Universal** tab > **Remove favorite**.
3. Select the screen to delete, and tap **OK**.
4. Tap the **Close** icon.
   The screen closes.

Operation complete

This section explains what you need to do when you change the module configuration (by installing or removing modules).

Reconfiguring the GX/GP (Module identification)

Reconfiguring the GX/GP

When you reconfigure the GX/GP and the GX60, the installed I/O modules are detected, and the settings are changed accordingly.
Reconfiguration is necessary in the following situations.

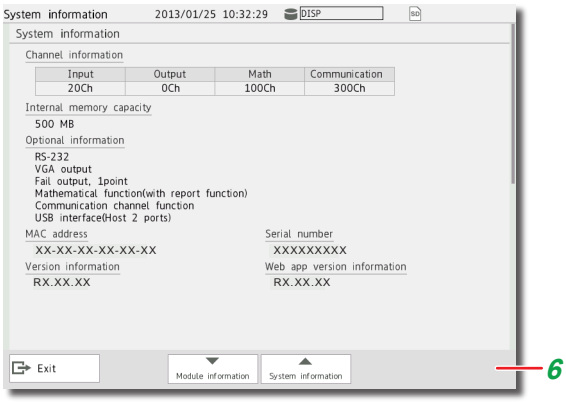
- If you specify modules separately
- If you change the modules (change to different modules)
- If you add or remove modules
- If you connect the GX60

If you purchased a model with preinstalled modules (/U[][]0 or /CR[][] option), you can start using the GX/GP right away without any reconfiguration. However, if you connect the GX60, change modules, add modules, or delete modules, you will need to reconfigure.

Note

You cannot reconfigure GX/GP while recording start.

1. Press **MENU**.
2. Tap the **Browse** tab.
3. Tap **Initialize Calibration**.
4. Tap **Reconfiguration**.
5. Tap **Execute**.
   The system information appears.



6. Tap **Reconfigure**.
7. Tap **OK**.

Operation complete

Note

Do not carry out the following operations while the GX/GP is reconfiguring.

- Turn the power off and on
- Insert or remove modules

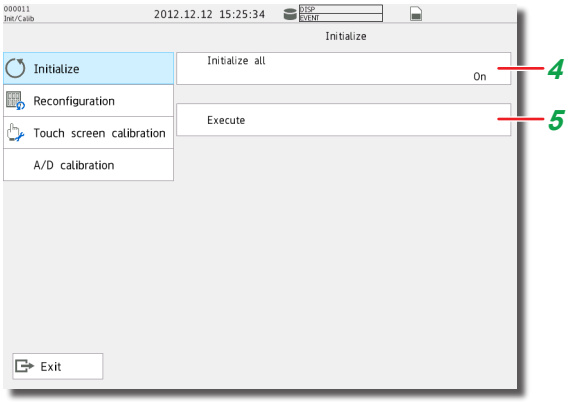
Initializing the GX/GP (Initializing all settings)

Initialize the GX/GP after reconfiguring the GX/GP when channels are not assigned to display groups. Channels are automatically assigned during initialization.
For details, see the User's Manual (IM 04L51B01-01EN).

Note

- This procedure is not necessary if you purchased an I/O module preinstalled model and do not need to change the configuration.
- If you initialize, setting parameters are reset to their factory defaults. We recommend that you back up setting parameters before initialization.

1. Press **MENU**.
2. Tap the **Browse** tab.
3. Tap **Initialize Calibration**.
4. Tap **Initialize all** > **On**.



5. Tap **Execute**.
   A confirmation screen is displayed.
6. Tap **OK**.
   The settings are initialized.

Operation complete

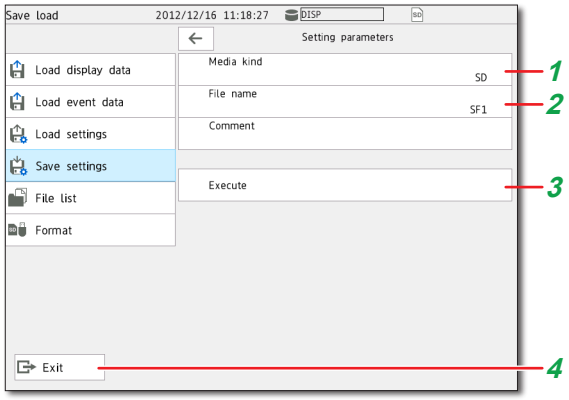
This section explains how to back up setting parameters.
Before you change the module configuration or settings, we recommend that you back up the setting parameters.

Saving and Loading Setting Parameters

Saving Setting Parameters

Save setting parameters to the SD memory card with the file name “SF1.”

Path **MENU** key > **Browse** tab > **Save load** > Menu **Save settings** > Setting parameters



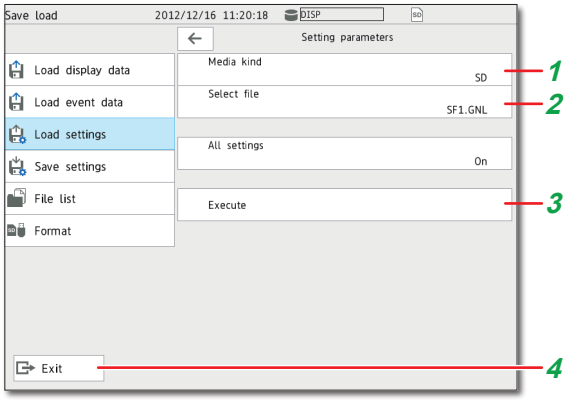
1. Tap **Media kind** > **SD**.
2. Tap **File name**, and enter SF1.
3. Tap **Execute**.
4. Tap **Exit**.

Operation complete

Loading Setup Parameters

Load the setup parameter file “SF1.GNL” from the SD memory card.

Path **MENU** key > **Browse** tab > **Save load** > Menu **Load settings** > Setting parameters



1. Tap **Media kind** > **SD**.
2. Tap **File name** > **SF1.GNL**.
3. Tap **Execute**.
4. Tap **Exit**.

Operation complete

Web Application

You can open the Web application simply by starting a Web browser (IE8, IE9, IE10, or IE11), and specifying the GX/GP IP address. You do not have to install any software. You can do the following on the Web application.

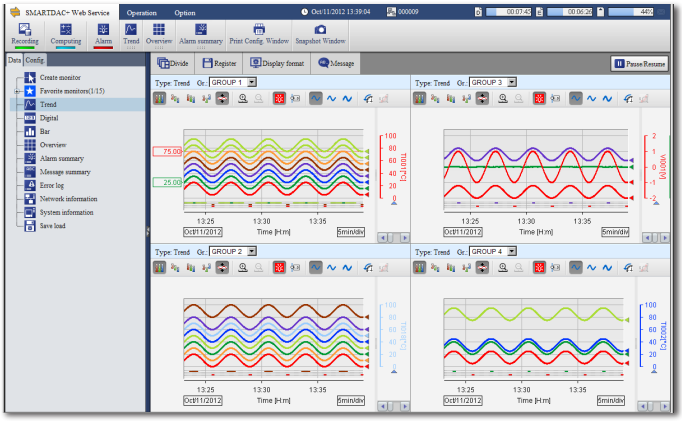
- Operate the GX/GP
- Monitor data
- Changing setting parameters

For details on configuring the environment settings to connect the GX/GP to an Ethernet network and how to use the software, see the User's Manual (IM 04L51B01-01EN).

Starting the Web Application

1. Start the Web browser.

2. In the Address box, enter "http://" followed by the GX/GP IP address.
   If DNS is available, you can specify the host name in place of the IP address.
   Example: When the IP address is "192.168.1.1," enter
   http://192.168.1.1
   in the Address box.
   The Web application starts, and the screen appears.



Operation complete

Closing the Web Application

When close the Web browser, the Web application also closes.

Application Software

The following software applications are available for the GX/GP.
- SMARTDAC+ STANDARD Universal Viewer
- SMARTDAC+ STANDARD Hardware Configurator

You can use SMARTDAC+ STANDARD Universal Viewer to display on screen and print the following types of data that is generated by recorders.
- Display data files
- Event data files
- Report data files (including hourly, daily, monthly, batch, and daily-custom, and free reports)
- Manual sampled data files

You can attach also convert measured data to ASCII or Excel formats.
You can use SMARTDAC+ STANDARD Hardware Configurator to create and edit setup data for the GX/GP recorder.

You can download the latest software and labels from the following URL.
URL: www.smartdacplus.com/software/en/

You can the labels on the front door of the GX/GP. Enter or print tag names on them for use. You can use Microsoft Office Excel 2003 or later to edit the labels.

You can download the product user's manuals from the following URL.
URL: www.smartdacplus.com/manual/en/

PC System Requirements

OS

OS	Type
Windows Vista	Home Premium SP2 (excluding 64-bit editions)
	Business Edition SP2 (excluding 64-bit editions)
Windows 7 Windows 8.1	Home Premium SP1 (32- or 64-bit edition)
	No edition, Pro

CPU and main memory

OS	CPU and main memory
Windows Vista	Intel Pentium 4, 3 GHz or faster x64 or x86 processor. At least 2 GB of memory.
Windows 7 Windows 8.1	32-bit edition: Intel Pentium 4, 3 GHz or faster x64 or x86 processor. At least 2 GB of memory.
	64-bit edition: Intel Pentium 4, 3 GHz or faster x64 processor. At least 2 GB of memory.

Web Browser

Compatible Browser	Version
Windows Internet Explorer Java Runtime Environment 1.7.0_xx (Version 7 Update xx) xx is 51 or more	Internet Explorer 8, Internet Explorer 9, Internet Explorer 10, or Internet Explorer 11

Hard disk

Free space of at least 100 MB (depending on the amount of data, you may need more memory).

Display

A video card that is recommended for the OS and a display that is supported by the OS, has a resolution of 1024×768 or higher, and that can show 65,536 colors (16-bit, high color) or more.

Other Operating Conditions

To view the user's manuals, you need to use Adobe Reader 7 or later by Adobe Systems (the latest version recommended).

Installation

To install Universal Viewer or Hardware Configurator, download the installer from the Yokogawa website.

1. Turn on the PC, and start Windows.
   Log onto Windows as an administrator.
2. Double click the installer (**.exe).
   The installer starts. Follow the instructions on the screen to install the software.

Note

- Close all other software applications before installing this software.
- To reinstall the software, uninstall the current software first.

Hardware Configurator
- The "Countries/regions except Japan" selection dialog box appears during installation. Select the country that you will use the software in.
- The HTTP port for using the Web browser is set to 34443. If this port is already in use by another application, you will not be able to start Hardware Configurator even if you install it. In such a case, perform the corrective action on section 1.4 in SMARTDAC+ STANDARD Hardware Configurator User's Manual (IM 04L61B01-02EN).

About the User's Manuals

The user's manual is installed with the software. To view the manual, on the **Help** menu, click **Instruction Manual**. You can also access it from **Start** > **All Programs**.
Use Adobe Reader 7.0 or later to view the manual.
The software and manual are installed for the following languages.

Universal Viewer

Language	Software	User's manual
Japanese	Japanese	Japanese
English	English	English
Chinese	Chinese	Chinese
French	French	English
German	German	
Russian	Russian	
Korean	Korean	

Hardware Configurator

Country Selected at Installation	Software	User's manual
Japanese	Display language selectable: Japanese/English/ German/French/ Russian/Chinese/ Korean	Japanese, English, Chinese
Regions except Japan		

Starting and Closing Universal Viewer

Starting Universal Viewer

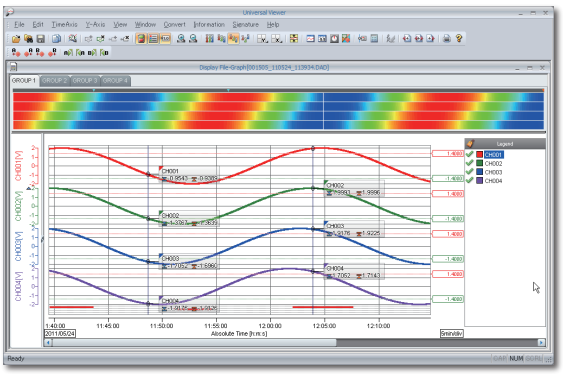
1. From the Start menu, click **All Programs** - **SMARTDAC+ STANDARD** - **Viewer**.
   Universal Viewer starts.

Closing Universal Viewer

1. On the **File** menu, click **Exit**. Or, click the **×** button.

Specifying a File Name and Opening the Data File

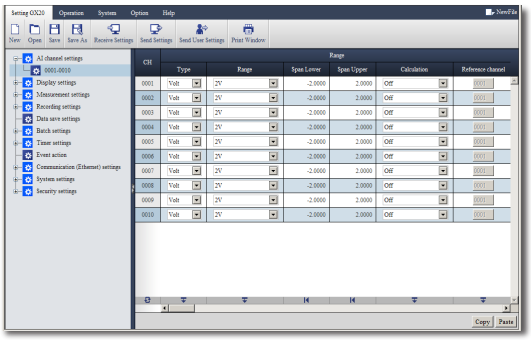
1. On the **File** menu, click **Open**. Or, click **Open** on the toolbar.
   The Open dialog box appears.
2. Select the data file you want to open, and click **Open**. Or, double-click the file.
   The data appears in the window.



Starting and Closing Hardware Configurator

Starting Hardware Configurator

1. From the **Start** menu, select **All Programs** - **SMARTDAC+ STANDARD** - **Hardware Configurator**.
   The first time Hardware Configurator starts after installation, the Windows Security Alert dialog box appears. Click **Unblock**.
   Hardware Configurator starts, and the following window appears.



Note

- Hardware Configurator will not start if Internet Explorer is not installed.
- The default settings are the system configuration of the GX10.

Closing Hardware Configurator

Close Internet Explorer.

1. Click the **Close** button; or on the **File** menu, click **Exit**.

Note

If you change the setup data, the changes are stored and will appear the next time you start the software.

Setup Menu Map

Depending on setting parameter values, some items may be hidden. For details, see the User's Manual (IM 04L51B01-01EN).

- AI channel settings, AI (mA) channel settings
  - Range
    - First-CH
    - Last-CH
    - **Range**
    - Type
    - Range
    - Span Lower
    - Span Upper
    - Calculation
    - Reference channel
    - Scale
    - Decimal place
    - Scale Lower
    - Scale Upper
    - Unit
    - Low-cut
    - On/Off
    - Low-cut value
    - Low-cut output
    - Moving average
    - On/Off
    - Count
    - RJC[1]
    - Mode
    - Temperature
    - Burnout set
    - Mode
    - Bias
    - Value
  - Alarm
    - First-CH
    - Last-CH
    - Level 1
    - On/Off
    - Type
    - Value
    - Hysteresis
    - Logging
    - Output type
    - Output No.
    - Level 2
    - On/Off
    - Level 3
    - On/Off
    - Level 4
    - On/Off
    - Alarm delay
    - Hour
    - Minute
    - Second
  - Display settings
    - First-CH
    - Last-CH
    - Tag
    - Characters
    - No.
    - Color
    - Color
    - Zone
    - Lower
    - Upper
    - Scale
    - Position
    - Division
    - Bar graph
    - Base position
    - Division
    - Partial
    - On/Off
    - Expand
    - Boundary
    - Color scale band
    - Band area
    - Color
    - Display position Lower
    - Display position Upper
    - Alarm point mark
    - Indicate on Scale
    - Mark kind
    - Alarm 1 color
    - Alarm 2 color
    - Alarm 3 color
    - Alarm 4 color
    - Display characters of each value
    - 0
    - 1
  - Calibration correction
    - First-CH
    - Last-CH
    - Mode
    - Mode
    - Number of set points
    - 1
    - Linearizer input
    - Linearizer output
    - Execution of input measurement
    - :
    - 12

* Not displayed for AI (mA) channel setting.

Setup Menu Map

- DI channel settings
  - Range
    - First-CH
    - Last-CH
    - Range
    - Type
    - Span Lower
    - Span Upper
    - Calculation
    - Reference channel
    - Scale
    - Decimal place
    - Scale Lower
    - Scale Upper
    - Unit
  - Alarm
    - First-CH
    - Last-CH
    - Level 1
    - On/Off
    - Type
    - Value
    - Hysteresis
    - Logging
    - Output type
    - Output No.
    - Level 2
    - On/Off
    - Level 3
    - On/Off
    - Level 4
    - On/Off
    - Alarm delay
    - Hour
    - Minute
    - Second
  - Display settings
    - First-CH
    - Last-CH
    - Tag
    - Characters
    - No.
    - Color
    - Color
    - Zone
    - Lower
    - Upper
    - Scale
    - Position
    - Division*
    - Bar graph
    - Base position
    - Division*
    - Alarm point mark
    - Indicate on Scale
    - Mark kind
    - Alarm 1 color
    - Alarm 2 color
    - Alarm 3 color
    - Alarm 4 color
    - Display characters of each value
    - 0
    - 1

- DO channel settings
  - Range
    - First-CH
    - Last-CH
    - Range
    - Type
    - Span Lower
    - Span Upper
    - Unit
    - Action
    - Energize/De-energize
    - Action
    - Hold
    - Relay Action on ACK
    - Relay deactivated interval
  - Display settings
    - First-CH
    - Last-CH
    - Tag
    - Characters
    - No.
    - Color
    - Color
    - Zone
    - Lower
    - Upper
    - Scale
    - Position
    - Bar graph
    - Base position
    - Display characters of each value
    - 0
    - 1

- Math channel settings
  - Calculation expression
    - First-CH
    - Last-CH
    - Math range
    - On/Off
    - Calculation expression
    - Decimal place
    - Span Lower
    - Span Upper
    - Unit
    - TLOG
    - Timer type
    - Timer No.
    - Sum scale
    - Reset
    - Rolling average
    - On/Off
    - Interval
    - Number of samples

Continued on the next page

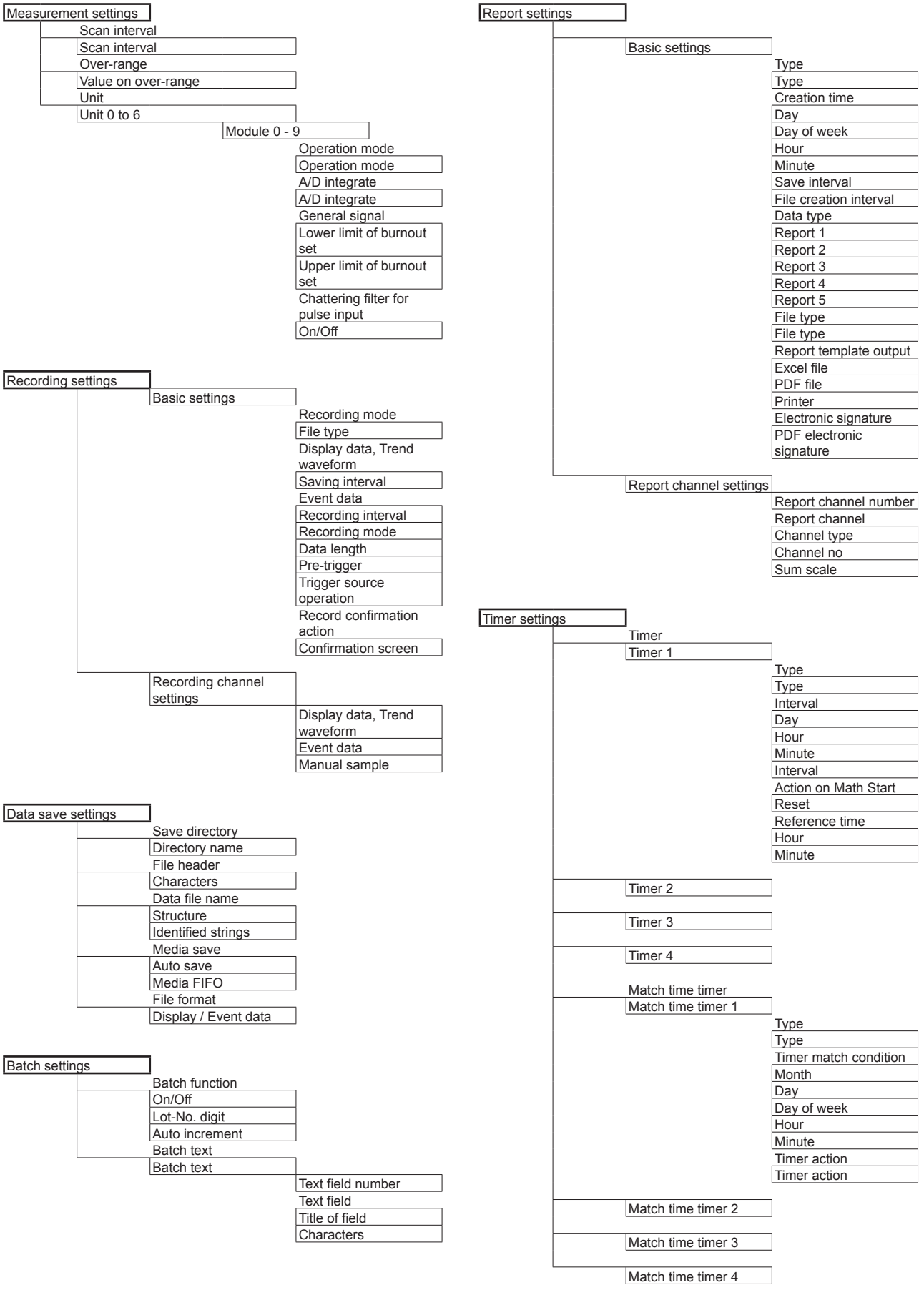
* When the range type is set to Pulse.

- Alarm
  - First-CH
  - Last-CH
  - Level 1
    - On/Off
    - Type
    - Value
    - Hysteresis
    - Logging
    - Output type
    - Output No.
  - Level 2
    - On/Off
  - Level 3
    - On/Off
  - Level 4
    - On/Off
  - Alarm delay
    - Hour
    - Minute
    - Second
- Display settings
  - First-CH
  - Last-CH
  - Tag
    - Characters
    - No.
  - Color
    - Color
  - Zone
    - Lower
    - Upper
  - Scale
    - Position
    - Division
  - Bar graph
    - Base position
    - Division
  - Partial
    - On/Off
    - Expand
    - Boundary
  - Color scale band
    - Band area
    - Color
    - Display position Lower
    - Display position Upper
  - Alarm point mark
    - Indicate on Scale
    - Mark kind
    - Alarm 1 color
    - Alarm 2 color
    - Alarm 3 color
    - Alarm 4 color
- Constant
  - Number of constant
  - Constant
    - K001
    - :
- Math action settings
  - Value on Error
  - START/STOP key action
  - Value on Overflow
    - SUM, AVE
    - MAX, MIN, P-P

- Display settings
  - Trend interval
    - Trend interval [/div]
    - Trend rate switching
    - Second interval [/div]
  - Group settings
    - Group number
    - Group settings
      - On/Off
      - Group name
      - Channel set
      - Scale image
        - On/Off
      - Trip line 1
        - On/Off
        - Position
        - Color
        - Line width
      - Trip line 2
        - On/Off
      - Trip line 3
        - On/Off
      - Trip line 4
        - On/Off
  - Message settings
    - Message number
    - Message
      - Message 1
      - :
  - Trend settings
    - Direction
    - Trend clear
    - Trend line
    - Grid
    - Scale
      - Digit
      - Value indicator
      - Digit of mark
    - Partial
      - On/Off
    - Message
      - Write group
      - Power-fail message
      - Change message
  - Screen display settings
    - Bar graph
      - Direction
    - LCD
      - Brightness
      - View angle[1]
    - Backlight saver
      - Mode
      - Saver time
      - Restore
    - Monitor
      - Display background
      - Scroll time
      - Jump default display
    - Calendar display
      - 1st weekday
    - Changing each value from monitoring
      - On/Off

1 GX10/GP10 only.

Setup Menu Map



- Event action
  - Event action number
  - Event action
  - On/Off
  - Event
  - Type
  - Number
  - Alarm level
  - Operation mode
  - Action
  - Type
  - Number
  - Detail
  - Group number

- Communication channel settings
  - On/Off, Span
    - First-CH
    - Last-CH
    - On/Off, Span
    - On/Off
    - Decimal place
    - Span Lower
    - Span Upper
    - Unit
    - At power on
    - Value at power on
    - Preset value
    - Preset value
    - Watchdog timer
    - On/Off
    - Timer
    - Value at timer-expired
  - Alarm
    - First-CH
    - Last-CH
    - Level 1
    - On/Off
    - Type
    - Value
    - Hysteresis
    - Logging
    - Output type
    - Output No.
    - Level 2
    - On/Off
    - Level 3
    - On/Off
    - Level 4
    - On/Off
    - Alarm delay
    - Hour
    - Minute
    - Second

- Display settings
  - First-CH
  - Last-CH
  - Tag
  - Characters
  - No.
  - Color
  - Color
  - Zone
  - Lower
  - Upper
  - Scale
  - Position
  - Division
  - Bar graph
  - Base position
  - Division
  - Partial
  - On/Off
  - Expand
  - Boundary
  - Color scale band
  - Band area
  - Color
  - Display position Lower
  - Display position Upper
  - Alarm point mark
  - Indicate on Scale
  - Mark kind
  - Alarm 1 color
  - Alarm 2 color
  - Alarm 3 color
  - Alarm 4 color

- Communication (Ethernet) settings
  - Basic settings
    - Automatic IP settings
      - Obtain IP address automatically
    - IP Address
      - IP Address
      - Subnet mask
      - Default gateway
    - Automatically DNS settings
      - Obtain DNS address automatically
    - DNS settings
      - Primary DNS server
      - Secondary DNS server
    - Domain suffix
      - Primary domain suffix
      - Secondary domain suffix
    - Host settings
      - Host name
      - Domain name
    - Host name registration
      - Host name registration
  - FTP client settings
    - FTP client function
      - On/Off
    - Transfer file
      - Display & Event data
      - Report
      - Manual sampled data
      - Alarm summary
      - Snap shot
      - Setting file[1]
    - Transfer wait time
      - Display & Event data
      - Report
    - Encryption
      - Encryption
      - Verification of certificate
    - FTP connection Primary
      - FTP server name
      - Port number
      - User name
      - Password
      - Directory
      - PASV mode
    - FTP connection Secondary
      - FTP server name
      - Port number
      - User name
      - Password
      - Directory
      - PASV mode
  - SMTP client settings
    - SMTP client function
      - On/Off
    - Authentication
      - Authentication
    - Encryption
      - Encryption
      - Verification of certificate
    - SMTP server
      - SMTP server name
      - Port number
      - User name
      - Password
    - POP3 server
      - POP3 server name
      - Port number
      - User name
      - Password
  - E-mail settings
    - Mail header
      - Recipient 1
      - Recipient 2
      - Sender
      - Subject
    - E-mail contents
      - Header
      - Include source URL
    - Alarm settings
      - Alarm notification
      - Channel set
      - Attach instantaneous data
      - Send alarm action
      - Include tag/ch in Subject
    - Report settings
      - Report notification
    - Scheduled settings
      - Scheduled notification
      - Attach instantaneous data
      - Interval (Recipient 1)
      - Ref. time hour (Recipient 1)
      - Ref. time minute (Recipient 1)
      - Interval (Recipient 2)
      - Ref. time hour (Recipient 2)
      - Ref. time minute (Recipient 2)
    - System settings
      - Memory full notification
      - Power failure notification
      - System error notification
      - Notification of user lockout[1]
  - SNTP client settings
    - SNTP client function
      - On/Off
    - SNTP server
      - SNTP server name
      - Port number
    - Query action
      - Ref. time (Hour)
      - Ref. time (Minute)
      - Interval
      - Timeout
      - Time adjust on Start action
  - Modbus client settings
    - Basic settings
      - Modbus client function
        - On/Off
      - Communication
        - Interval
      - Recovery action
        - Wait time
      - Connection
        - Keep connection
        - Connection timeout
    - Modbus server settings
      - Server number
      - Modbus server settings
        - Server name
        - Port number

Continued on the next page

    - Command settings
      - Client command number
      - Command settings
        - Type
        - Server
        - Unit No.
        - Data type
        - Register
        - Channel type
        - First-CH
        - Last-CH

- WT connection client settings
  - Basic settings
    - WT connection client function
      - On/Off
      - Communication
      - Interval
      - Recovery action
      - Wait time
  - WT server settings
    - Server number
    - WT server settings
      - On/Off
      - Server name
      - Model name
  - WT data allocation settings
    - Allocation No
    - WT data allocation setting
      - On/Off
      - Server No
      - Data group name
      - Data name
      - Exponential scaling
      - Communication channel
- KDC client settings[1]
  - KDC connection Primary
    - Server name
    - Port number
  - KDC access point Secondary
    - Server name
    - Port number
  - Certification key
    - Host principal
    - Realm name
    - Password
    - Encryption
- Server settings
  - Sever function
    - Keep alive function
      - On/Off
      - Timeout function
      - On/Off
      - Timeout (minute)
      - FTP server
      - Output Directory Format
      - Modbus server
      - Modbus delay response
  - Allowed Modbus clients
    - Modbus client connect limits function
      - On/Off
      - 1
      - On/Off
      - IP Address
      - :
  - Server list
    - FTP
      - On/Off
      - Encryption
      - Port number
      - HTTP
      - On/Off
      - Encryption
      - Port number
      - SNTP
      - On/Off
      - Port number
      - MODBUS
      - On/Off
      - Port number
      - GENE
      - On/Off
      - Port number
      - EtherNet/IP[3]
      - On/Off
      - DARWIN
      - On/Off
      - Channel conversion

1 On a GX/GP with the advanced security function (/AS option) with the function enabled
2 Only on GX/GPs with the /E2 WT communication option.
3 Only on GX/GPs with the /E1 EtherNet/IP communiction option.

- Communication(Serial) settings
  - Basic settings
    - Receiver
      - Function
      - Address
      - Data transfer
      - Baud rate
      - Parity bit
      - Stop bit
      - Data length
      - Handshake
      - Logout
      - Auto logout
      - DARWIN
      - Channel conversion
  - Modbus master
    - Basic setting
      - Master function
      - On/Off
      - Communication
      - Interval
      - Communication timeout
      - Gap between messages
      - Recovery action
      - Retransmission
      - Wait time
    - Command settings
      - Master command number
      - Command settings
      - Type
      - Slave
      - Data type
      - Register
      - Channel type
      - First-CH
      - Last-CH

- System settings
  - Environment (Language) settings
    - Language
    - Temperature
    - Decimal Point Type
    - Date format
    - Date format
    - Delimiter
    - Month indicator
  - Alarm basic settings
    - Rate of change
    - Decrease
    - Increase
    - Indicator
    - Hold/Nonhold
    - Alarm ACK
    - Individual alarm ACK
  - Time basic settings
    - Time zone
    - Hour
    - Minute
    - Gradually adjusting the time
    - Time deviation limit
    - Time adjustment beyond limit
    - Daylight Saving Time
    - Use/Not
    - Start time
    - Month
    - Day order
    - Day of the week
    - Hour of the day
    - End time
    - Month
    - Day order
    - Day of the week
    - Hour of the day
  - Internal switch settings
    - First number
    - Last number
    - Internal switch
    - Type
    - And/Or
  - Status relay
    - Fail relay
    - Memory/Media status
    - Measurement error
    - Communication error
    - Record stop
    - Alarm
  - Printer settings
    - IP Address
    - Paper size
    - Page orientation
    - Resolution (dpi)
    - Number of copies
    - Snapshot
    - Paper size indicator
  - Sound, LED
    - Sound
    - Touch
    - Warning
    - LED
    - MENU key LED
  - Instruments tag
    - Instruments tag
    - Instrument tag No.
  - Setting file
    - Setting file comment
    - Configuration change comment[1]
    - Input comment
  - USB input device
    - USB input device

1 On a GX/GP with the advanced security function (/AS option) with the function enabled.

- Security settings
  - Basic settings
    - Security function
    - Touch operation
    - Communication
    - Logout
    - Auto logout
    - Operation without Login
    - Password management [1]
    - On/Off
    - Root user password
    - Password retry [1]
    - Password retry
    - User ID[1]
    - On/Off
  - User settings
    - User number
    - User settings
    - User level
    - Mode
    - User name
    - User ID[1]
    - Initialize password
    - Password expiration[1]
    - User property
    - Authority number
    - Sign in property[1]
    - Authority of signature[1]
  - Authority of user
    - Authority number
    - Authority of user
    - Record
    - Math
    - Data save
    - Message
    - Batch
    - Alarm ACK
    - Communication
    - Touch operation
    - Time set
    - Setting operation
    - Calibration correction
    - External media
    - System operation
    - Output operation
  - Operation Lock
    - Operation Lock function
    - Password
    - Limitations
    - Record
    - Math
    - Data save
    - Message
    - Batch

Continued on the next page

- Alarm ACK
- Communication
- Touch operation
- Time set
- Setting operation
- Calibration settings [1]
- External media
- System operation
- Output operation

- Sign in settings [1]
  - Sign in type
  - Type
  - Recording stop action
  - Sign in
  - Data file transfer
  - FTP transfer timing
  - Sign in title
  - Sign in 1
  - Sign in 2
  - Sign in 3

- Sign in property [1]
  - Authority of signature
  - Sign in property
  - Sign in 1
  - Sign in 2
  - Sign in 3

1 On a GX/GP with the advanced security function (/AS option) with the function enabled.

Expansion Module Error Codes

Error	Error Name	Error Description	Corrective Action
F1	Secondary boot read error	Failed to read the secondary boot program of the expansion module. There may be a problem reading the flash RAM.	Contact your nearest YOKOGAWA dealer.
F2	Firmware download error	Failed to read the flash memory of the expansion module.	
F3	DRAM read error	There is an error in the DRAM of the expansion module.	
F4	System data error	There is an error in the system data (MAC address, product serial number) of the expansion module.	
F5	Ethernet error	There is an error in the EXBus controller of the expansion module.	
E1	Unit number error	The unit number setting is incorrect.	Set the unit number in the range of 0 to 6.
E2	Multiple expansion module connection	There are multiple expansion modules connected to the GX main unit or the extended unit.	Install a single expansion module in the correct slot.
E3	Slot error	An expansion module was installed to an in appropriate slot position when the module is operating in slave mode.	Install the expansion module in the correct position.
E4	Duplicate unit numbers	There are duplicate expansion module unit numbers.	Reassign the unit numbers so that they do not overlap.
E5	Download error	Failed to update the expansion module.	Update the expansion module again.
E6	Extended unit master mode error	The master I/O expansion or slave I/O expansion operation setting of the expansion module is incorrect.	Set dipswitch 8 of the expansion module correctly.
E7	EXBus connection error	A device other than an expansion module is connected to EXBus.	Disconnect devices other than the expansion module from EXBus.
Px (x: 0 to 5)	Module insertion and removal	Appears when a module is inserted or removed. x indicates the slot number.	–